

H.R. 4316 AND H.R. 3112: INVENTIONS IN OUTER SPACE

HEARING BEFORE THE SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS OF THE COMMITTEE ON SCIENCE AND TECHNOLOGY HOUSE OF REPRESENTATIVES NINETY-NINTH CONGRESS

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H.R. 4316 AND H.R. 3112: INVENTIONS IN OUTER SPACE

TUESDAY, AUGUST 12, 1986

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS,
Washington, DC.

The subcommittee met, pursuant to call, at 1:05 p.m., in room 2325, Rayburn House Office Building, Hon. Bill Nelson (chairman of the subcommittee) presiding.

Mr. NELSON. Good afternoon. The committee will come to order.

The Space Subcommittee is conducting a hearing today to receive comments on two pieces of legislation. These separate bills amend title 35 of the United States Code and the National Aeronautics and Space Act with respect to the applicability of the U.S. patent law to activities that might occur in the future in outer space.

Well, this topic is a new one, we're plowing new ground, and there is under the present patent law a certain ambiguity that surrounds the application of the U.S. patent law to activities in space, and so a concern has arisen which conceivably could potentially delay this country's development of commercial activities in space.

It's interesting that as we take terrestrial laws and then terrestrial laws that apply to activities here on the surface of this planet, and then we suddenly find that similar activities are conducted in space, then those terrestrial laws do not necessarily apply. This is also the case with regard to a number of provisions of the tax law, giving incentives for business such as in the investment tax credit, in accelerated depreciation—I said the investment tax credit—those kinds of applications don't apply to manufacturing activities in space, and thus Mr. Downey of New York and I have filed a bill addressing this particular issue, and it is our hope that in the conference that is now going on on the Federal income tax law that that will be one of the changes.

Well, today the subject of this hearing is similar, taking terrestrial law, patent law, taking a new kind of activity in space that in the past was only considered to be on Earth, and applying that particular law to see if it's deficient. Now we have plenty of evidence that says that it may be deficient, and thus the reason for this hearing today.

To help us understand this particular topic and to discuss this legislation, we welcome Mr. Robert Kempf, the associate general counsel for intellectual property. We also welcome Mr. Michael Kirk from the Department of Commerce, who is the Assistant Com-

missioner for External Affairs for the Patent and Trademark Office, and Mr. Kempf, of course, is the associate general counsel from NASA.

Representing industry and private concerns, we welcome Dr. Krogh, who is on his way from the airport right now, vice president for research and development for 3M, and Mr. Dennis Burnett, who is a partner in the law firm of Benner, Burnett & Coleman.

Dr. Krogh, welcome. Your plane was right on time. We're delighted to have you.

So let me turn to my colleague, my ranking member, Mr. Walker, for any opening comments that he has.

Mr. WALKER. I have no opening statement, Mr. Chairman.

Mr. NELSON. OK. We will proceed.

Mr. Kempf.

STATEMENT OF ROBERT F. KEMPF, ASSOCIATE GENERAL COUNSEL (INTELLECTUAL PROPERTY), OFFICE OF GENERAL COUNSEL, NASA, WASHINGTON, DC

Mr. KEMPF. Thank you, Mr. Chairman and members of the committee. I appreciate this opportunity to participate in hearings which address the applicability of U.S. patent laws to activities conducted in outer space.

I would like to submit for the record a more detailed statement, and I have a summary statement I'd like to present orally, if I may.

Mr. NELSON. Please.

Mr. KEMPF. NASA considers all aspects of intellectual property law, including laws relating to patents and inventions, and irrespective of whether such laws apply to activities occurring in inner space or outer space, to be a very important factor in carrying out the U.S. space program. The importance of such laws is equally shared, we believe, by the U.S. private sector, and that is the way it should be, in that adequate and appropriate protection of intellectual property rights is also an important consideration in private efforts relating to the commercial use of space by U.S. industry.

We have from time to time made an assessment of these laws, and they indicate that there should not be a different body of law unique to either NASA's activities or activities conducted in outer space. As a practical matter, most legally relevant events affecting intellectual property rights will transcend any interfaces between the public and private sectors, as well as any boundaries that may be established between inner space and outer space. This assessment has been approached from two perspectives—the substantive protection that may be afforded by any legal regime, such as that proposed in H.R. 3112 that relates to inventions made in outer space, and also the clarity and certainty as to how existing law may be applied to activities occurring in outer space, such as provided by H.R. 4316.

As to the substantive law and H.R. 3112, the conclusion we have reached is that the present law is, or should be, if properly applied, adequate for outer space in the same manner that it is adequate

for any similar activity in inner space, or any similar terrestrial-based activity. If, however, the present law is deemed inadequate as applied to outer space, it is our feeling that the matter should be approached generically with particular regard to the effect that it may have on solely private relationships, including the effect on the common law regarding ownership of inventions and title 35 of the United States Code relating to inventorship.

In considering this assessment, it is crucial to note that in developing its present policies under existing law, NASA has made a clear and important distinction between inventions made or used in privately funded activities, and inventions that are made or used in performing work for NASA under contract or grant. In the former situation, the laws relating to the disposition of rights to inventions for federally funded activities do not apply. That is, they do not apply to joint endeavors, technical exchange agreements, and reimbursable agreements, and the like, that NASA enters into with the private sector. Rather, the basic common law principles and title 35 of the United States Code, except for chapter 18, apply in the same manner that they are applied by private parties in a nonfederally funded activity in any similar inner space or terrestrial arrangement.

Thus, it is our view if any changes to the law are made on the basis of whether or not such commercial use type activities are carried out in outer space rather than inner space, it would have to be by changing the existing common law principles and title 35, except for chapter 18, as applied to all similar private sector activities. NASA does not believe that this is needed, desirable, or, in some instances, even workable. As to inventions that are made or used in the performance of work for NASA under contract or grant, NASA follows the same policies as other Federal agencies consistent with chapter 18 of title 35 of the United States Code, to the extent permitted by law.

NASA's policies and procedures in this regard are discussed in somewhat more detail in the written statement that we have submitted. Basically, however, even though there are some procedural differences because of the requirements of section 305 of the Space Act, a contractor may receive title under NASA's waiver process under the same circumstances and subject to the same conditions as a contractor may elect title in a similar type funding agreement with other agencies. Thus, there is substantial similarity in the result achieved.

Given these established policies and procedures under present law both for privately funded and federally funded inventions, the overall assessment is that enactment of H.R. 3112 will not necessarily be of benefit to NASA's activities regarding the commercial use of space and, in fact, could create some problems in this regard.

Now, I have presented a detailed discussion of some of these problems in my written statement and won't repeat them here.

I would like to make the point that, in addition to NASA's concerns in some of these areas as they relate to the NASA funded activities, some of these same issues may well be raised by the private sector in assessing H.R. 3112. As a matter of fact, I was advised within the last couple of days that the patent, trademark, and copyright section of the American Bar Association in their

annual meeting in New York, has voted to adopt the resolution that opposes H.R. 3112. They oppose both the concept that different treatment should be given to inventions in outer space than in inner space, and they also oppose some of the specific provisions as written, in that they affect private ownership of inventions.

Also, Mr. Chairman, I prepared some time ago a paper, which is a paper that is a publicly available document, that discusses and summarizes NASA's existing policies, procedures, and practices in this area independent of the effect of these two proposed bills. It does, however, provide some background as to where we stand at the present, and I'm willing to submit that paper for the record, if you so desire.

Mr. NELSON. Thank you. It shall be.

[The paper follows:]

INTELLECTUAL PROPERTY RIGHTS
AND COMMERCIAL USE OF SPACE

Robert F. Kempf
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for Patent Matters
National Aeronautics & Space Administration

Introduction

One factor that plays a major role in any high-risk, long lead time research, development and demonstration activities directed towards the commercial application of new technology is the need for protection that provides some exclusivity for that technology as an aid in assuring a return on investment, and to minimize predatory, second-to-market practices. While this need for exclusivity may differ depending on the nature of the technology and the various economic and competitive factors involved, it is usually a truism that in most situations the higher the risk or the longer the lead time, the greater the exclusivity needed as an incentive for a significant private commitment of funds.

From a legal point of view, this exclusivity may be established by the protection afforded under the laws relating to intellectual property rights. These rights manifest themselves in two basic ways that are particularly germane to commercial applications of new technology: patent protection and trade secret protection.

NASA has historically viewed its policies and procedures relating to these intellectual property rights as an integral part of NASA's overall responsibilities to stimulate the creation, identification and reporting of new technology created in support of its programs, and to foster the utilization of this new technology in commercial applications for the benefit of the United States economy.² This approach was initially reflected in NASA's approaches to intellectual property rights as they related to NASA-funded contracts and grants, but has evolved over the years to adjust to changing needs and circumstances to accommodate a range of agreements or arrangements which NASA may enter into with the private sector. It has, therefore, been through this evolutionary process that NASA has arrived at its present policies and procedures for the treatment of intellectual property rights as they relate to all NASA activities, as discussed below. Particular emphasis is placed on what are known as "Space Act" agreements such as

joint endeavors, reimbursable agreements, and related arrangements that have been developed by NASA to encourage and facilitate access to, and the commercial use of, space.³

Joint Endeavors and Related Activities

NASA's policies and procedures regarding inventions and patents resulting from a Space Act agreement (such as a joint endeavor or related arrangement) under which NASA and a private-sector participant carry out mutually-agreed responsibilities and each party funds their own responsibilities, are structured to maximize the objective of the agreement (such as the encouragement of the commercial use of space). A salient feature of such agreements is that they are not "contracts" subject to section 305 of the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2457), which section would require NASA to obtain title to such inventions and patents unless title is waived.⁴ Also, these agreements are not considered "funding agreements" that are subject to 35 U.S.C. 200-204.⁵ A basic premise is that, as an incentive for commercial use of space, the private-sector participant may retain all right, title and interest to any inventions and patents arising out of its responsibilities under the agreement, subject to certain contingent rights reserved by NASA consistent with the objective of the agreement.

While these contingent rights relating to inventions and patents are a matter of negotiation depending on the technology involved, the respective responsibilities of each party, and the commercial-use objectives sought, in a typical joint endeavor agreement wherein the private-sector participant develops and provides flight hardware and NASA provides one or more flights on the Space Transportation System (STS) in order to demonstrate the feasibility of a space manufacturing process, NASA may receive a royalty-free license for certain stated Governmental purposes, as well as the right to license others upon reasonable terms and conditions in the event the private-sector participant has not, or cannot be reasonably expected to take, effective steps to achieve commercial use, or if the private-sector participant unilaterally terminates in some situations. If the involved technology is the type that could directly affect the public health or safety, the contingent rights may be expanded to assure that such technology is reasonably available to meet those needs. Early termination will usually leave all rights with the private-sector participant unless the parties mutually agree to negotiate otherwise. Somewhat different contingent rights will be considered if there is unilateral termination by the private-sector participant after further commitments are made by NASA. In all instances (unless otherwise mutually agreed

for certain minimum license rights) these contingent rights will not become effective unless an express determination is made by the NASA Administrator, or designee, as to the need to exercise the right. In making such determination the private party is given notice, an opportunity to present facts and reasons why it should not be made, the opportunity for an administrative hearing within NASA, and the right to seek legal redress, before the determination becomes final and acted upon.

The same basic tenets discussed above also apply to data furnished to NASA by the participant under joint endeavors and related arrangements, and again, the rights and obligations of the parties under such agreements are considered on a case-by-case basis, taking into account the specific technology involved, the respective responsibilities of both parties, and the interrelation of intellectual property rights to the technology and the objectives to be achieved. As a general rule, the amount of data furnished to NASA by the private-sector participant is kept to a minimum. However, in recognition of the mutual objectives of both parties, as well as the diversity of the nature of the activities, there is usually a need to have a clear understanding as to certain data which NASA is to obtain without restriction and may be released to the general public. Beyond that understanding, if any data that is required to be furnished to NASA qualifies as a trade secret or is commercial or financial and confidential or privileged, NASA will agree to limit its use, duplication and disclosure to only those activities necessary for NASA to carry out its concomitant responsibilities under the agreement so as not to compromise the intellectual property rights in, or commercial value of, such data.

NASA also obtains certain contingent rights regarding data developed or used by the private-sector participant in support of the agreement, structured to be compatible with the contingent rights obtained in relation to inventions and patents. That is, the private-sector participant may agree to provide sufficient data, and attendant rights, to either NASA or third parties, in those limited situations where the private-sector participant is not pursuing the commercial-use objectives of the agreement, fails to perform, unilaterally terminates under certain circumstances, or as may be needed to practice license rights acquired under patents and inventions. As is the case with inventions and patents, this will be under reasonable terms and conditions, as well as under protective conditions so as not to compromise the intellectual property rights in, or commercial value of, the data. Also, the same procedural safeguards apply to a determination to exercise

contingent rights in relation to data as apply to the contingent rights for patents and inventions.

As to intellectual property rights (both patent rights and data rights) arising out of, or used in, NASA's responsibilities (as distinguished from those of the private-sector participant) under the agreement, NASA acquires such rights as applicable and available under the circumstances giving rise to such rights. If needed in furtherance of the mutual objectives of the agreement, and to the extent available under the circumstances giving rise to them, NASA will make such rights available to the private-sector participant. This availability may be on a nonexclusive basis, or in appropriate circumstances the private-sector participant may be afforded some degree of exclusive commercial rights.

Reimbursable Activities

It is NASA policy not to acquire rights to any inventions or patents which may be used in or result from an activity for which NASA is reimbursed. This has been, for example, a long-standing NASA policy for reimbursable launches on expendable launch vehicles, and has been expressly stated in policy directives relating to the (STS), as well as in the standard launch service agreement for STS. This policy is, however, equally applicable to other reimbursable activities carried out on behalf of a private-sector sponsor.

Data is acquired from a sponsor under a reimbursable agreement only to the extent necessary to enable NASA to carry out its responsibilities under the agreement, and efforts are made to limit such data to that which may be used and disclosed without restriction. Thus, for example, under the standard launch agreement as a general rule only that data necessary for payload integration, establishment of launch parameters, safety checks, determination of orbital performance, verification of peaceful purposes and compliance with law, and related matters is acquired. Much of this data would neither qualify for protection as a trade secret nor be considered commercial or financial information that is privileged or confidential (i.e. it is form, fit and function data, data readily apparent by inspection, or data which the customer either has not maintained, or does not wish to maintain in confidence or protect as a trade secret). Thus for administrative convenience and in order to minimize legal risks the expectation (and intent) is that data furnished to NASA in order to carry out a reimbursable launch will be kept to a minimum, but if provided, should be of the type that can be furnished without restriction.

There may, however, be some circumstances under which some of the data furnished to NASA (or even developed by NASA on behalf of the sponsor) under a reimbursable agreement may either qualify as a trade secret or may be considered commercial or financial information that is privileged or confidential, and which the sponsor wishes to protect from unauthorized use and disclosure in order to maintain its trade secret or confidential status. In this event the agreement will include provisions as to the type of data to be protected, the steps to be taken to assure protection, as well as an understanding that such data is to be treated in confidence to the extent permitted under law, with specified limitations on its use, duplication and disclosure. Since, as indicated, protection of such data imposes administrative burdens and increases legal risks, requirements that NASA be in possession of, or have access to, data which is to be kept in confidence is kept to a minimum.

NASA Funded Activities

The NASA patent policies for NASA-funded activities under contract or grant, as well as the procedures for implementing those policies, are based on section 305 of the National Aeronautics and Space Act of 1958 as amended (42 U.S.C. 2457), and to the extent consistent with that section, the Presidential Memorandum on Government Patent Policy of February 18, 1983. An exception is made for funding agreements with certain small business firms and nonprofit organizations, where NASA follows 35 U.S.C. 200-204, as implemented by OMB Circular A-124, in the same manner as all other agencies.

Essentially, section 305 of the Space Act provides that any invention conceived or first actually reduced to practice in the performance of any work under any NASA contract becomes the exclusive property of the Government unless the Administrator (of NASA) determines that the interests of the United States will be served by waiving all or any part of the Government's rights. In making such waiver determinations, NASA has adopted the Presidential Memorandum of February 18, 1983, as a guide. This Memorandum, in turn, is based on the policy of fostering private commercialization through the investment of risk capital. Thus, waivers are liberally granted.¹⁰ A similar result is achieved, albeit by a different procedure, by election of title by a small business firm or nonprofit organization under 35 U.S.C. 200-204. Any waiver of title by NASA, or any election of title by a contractor, is subject to a royalty-free license for Governmental purposes and certain so-called "march-in" rights (as set forth in 35 U.S.C. 200-204) in order to protect the Government and public interests. The practical result is that all NASA contractors and grantees are

afforded the same substantive rights, under the same circumstances, as other Government agencies under the Presidential Memorandum and/or 35 U.S.C. 200-204, albeit by a different procedural route for contracts subject to section 305 of the Space Act.¹¹

NASA's policies regarding rights to data developed under, or used in, contract performance are covered in part by Public Law 98-577, which requires agency regulations to define the "legitimate proprietary interests" of the contractor and the Government, taking into consideration whether the data was wholly funded by the contractor or the Government, or partially funded by each.¹² There are, in addition, collateral statutory provisions such as section 203(a)(3) of the Space Act (42 U.S.C. 2473(a)(3)) and the Freedom of Information Act (5 U.S.C. 552) relating to the public availability of some data involved in or resulting from NASA activities that must be considered in implementing and applying these policies. Thus it is NASA policy normally to acquire data first produced in the performance of a contract without restriction regarding its publication, use or disclosure (i.e. with unlimited rights). It is also NASA policy not to acquire certain "protectible" data which represents a contractor's legitimate proprietary interest (i.e. which data embodies trade secrets or which is commercial or financial and privileged or confidential) unless necessary, but if necessary, to acquire such data under express agreement or understanding not to use or disclose it in a manner that would compromise its value as an intellectual property right (i.e. to acquire it with limited or restricted rights maintaining its trade secret status or confidentiality). Care is taken to agree to protect only that data which can be protected under law (such as the Freedom of Information Act), but once agreed to, maximum protection is assured. However, in order to minimize administrative burdens and legal risks, as an overriding consideration it is NASA policy not to acquire protectible data which represents a contractor's legitimate proprietary interest unless there is a real need for it.¹³

Special consideration is also given to certain contracts involving co-sponsored research and development activities wherein the contractor is required to make substantial contributions of funds or resources (such as by cost-sharing or by repayment of nonrecurring costs). Where appropriate, NASA may negotiate special clauses (i.e. license rights) for data produced under the contract tailored to the circumstances, which will enable the contractor to retain some commercial rights (i.e. partial exclusivity) in consideration of such contributions and consistent with the objectives of the co-sponsored research and development.¹⁴

Licensing of NASA-Owned Patents

NASA has an active program for licensing those inventions for which NASA has acquired title, either from its employees or from its contractors. Exclusive licenses, partially exclusive, or nonexclusive licenses, as appropriate, are available.¹⁵ These licenses may be to practice the patented invention, only, or may be in conjunction with, or in support of, technical assistance arrangements or collateral Space Act agreements (such as joint endeavors or related activities) structured to obtain commercial use of the involved technology. To the extent practicable and appropriate under the circumstances, NASA will endeavor to provide supporting technology and consulting assistance to a licensee.

Conclusion

Foremost in the current development of NASA's policies and procedures for the treatment of intellectual property rights is the recognition of a need to provide an environment conducive to private investment in the furtherance of commercial activities in space. As a result, the policies and procedures as discussed above have been developed to provide maximum protection of privately-established intellectual property rights, and to encourage commercial development and use of NASA-supported technology by affording exclusivity (either by waiver of title or by licensing NASA-owned patents), to the extent practicable and appropriate. NASA views this development as an evolutionary process and is willing to adjust to changing needs and newly identified issues, consistent with overall mission objectives, statutory obligations and national policy.

FOOTNOTES

¹The laws in the United States relating to patents are derived from the U.S. Constitution, Article I, Section 8, and established by title 35 of the United States Code. This statute prescribes certain standards as well as the procedures and formalities to be followed in order to establish and maintain patent protection. Once a valid patent is established and maintained, protection is afforded against all potential infringers within the United States, including those who may independently develop the invention. This includes reasonable compensation (but not injunctive relief) if infringement is incurred as the result of activities by or on behalf of the Government (28 U.S.C. 1498(a)).

The law of trade secrets, on the other hand, is based on the common law. That is, protection is afforded only to the extent provided by state or local law, and not under Federal statute. A significant distinction between trade secret protection and patent protection is the element of secrecy or confidentiality, with which the subject matter of a trade secret must be cloaked. In addition, the standards as to the subject matter that may be subject to trade secret protection are more a matter of agreement between the parties than any external standard. Thus if the proprietor of a trade secret is to make it available to another, the subject matter must be identified and made available under an understanding of confidentiality which the other party is aware of and agrees to, or protection may be compromised. Also, trade secret protection is enforceable only against parties who breach this understanding of confidentiality or otherwise acquire the trade secret by improper means, and not against those who may independently or innocently discover it. Trade secret protection, properly established and maintained, may also be enforceable against a Government agency (Chrysler Corp. v. Brown, 441 U.S. 281, 1979; Megapulse, Inc. v. Lewis, 672 F.2d 959, 1982; Ruckelhaus v. Monsanto Co., 102 S.Ct. 2862, 1984).

²These responsibilities are based on the following provisions of the National Aeronautics and Space Act of 1958, as amended:

Section 102(c)(5) (42 U.S.C. 2451(c)(5)), which as a declaration of policy and purpose requires that the aeronautical and space activities of the United States shall be conducted so as to contribute materially to the objective of preserving "--the role of the United States as a leader in aeronautical and space science and technology and in the application thereof to the conduct of peaceful activities within and outside the atmosphere";

Section 203(a)(3) (42 U.S.C. 2473(a)(3)), which directs NASA to "--provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof"; and

Section 305(b) (42 U.S.C. 2457(b)), which requires NASA contracts to contain "effective provisions" to assure full and prompt reporting of new technology produced in the performance of the contract.

Protection of privately-established intellectual property rights, waiver of title to inventions made under contract to encourage private commercial development, and licensing of NASA-owned inventions for commercial use have been important considerations in the interpretation and implementation of these provisions.

³These "Space Act" agreements are based on the direct authority of section 203(c)(5) and (6) of the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2473(c)(5) and (6)). Of significance is the fact that they are not procurement contracts or assistance transactions.

⁴An extensive discussion which forms a basis for this decision is set forth in a memorandum by NASA's Office of Assistant General Counsel for Patent Matters, entitled "Applicability of Section 305 of the Space Act to Joint Endeavors" (June 19, 1979). This memorandum is part of the record in a Report on Patent Policy, Hearings on S. 1215, Ninety-Sixth Congress, First Session, before the Subcommittee on Science, Technology, and Space, of the Committee on Commerce, Science, and Transportation, United States Senate, July 23 and 27, and October 25, 1979 (Part 1, Serial No. 96-60, pgs. 186-199). In this memorandum a joint endeavor is defined:

"A joint endeavor is an arrangement between NASA and a party or parties in which each undertakes to contribute to or participate in a project of mutual benefit, and which usually involves the use of equipment, facilities, services, personnel or information made available by one or more of the parties for use by the others. Such endeavors do not involve the transfer of funds or title to property between the parties, and are not considered a procurement or assistance transaction within the purview of Pub. L. 95-224. Services which may be involved do not constitute the employment of one of the party's employees by the other."

Given this definition, and an analysis of the legislative history of section 305 of the Space Act and NASA's

interpretation and application thereof over the years, this memorandum concludes that a joint endeavor is not subject to the legal constraints of section 305, and that the allocation of property rights in inventions under any joint endeavor is a matter of agreement between the parties that must be specifically set forth in the joint endeavor.

⁵ A "funding agreement," as defined in 35 U.S.C. 201, is any "contract, grant or cooperative agreement entered into between any Federal agency--and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government." Thus the same basic rationale set forth in the memorandum referred to in footnote 4 also applies to 35 U.S.C. 200-204.

⁶ A joint endeavor agreement of the type described represents one of the most comprehensive arrangements possible, and less comprehensive arrangements may not need such extensive contingent rights. For example, in technical assistance agreements of a more generic nature and where NASA's responsibilities do not include commitment to STS flights, mutually-agreed license rights for certain NASA or Governmental purposes may suffice. In fact, in some agreements rights to inventions and patents (as distinguished from data rights) are not a factor because of the nature of the activities and are not addressed in the agreement.

⁷ As a general rule, there needs to be an understanding as to what data is to be made available to NASA or exchanged between NASA and the private-sector participant, as well as the rights thereto. While this understanding can vary a great deal depending on the respective responsibilities under the agreement, at a minimum the agreement should include an understanding as to that data that is to be made available or exchanged without restriction, as well as the mode of protecting restricted data (i.e. data that embodies trade secrets or is commercial or financial and privileged or confidential). As to protecting restricted data, this may be by agreement that it will not be made available or exchanged; or by agreement of confidentiality limiting its use and disclosure if made available or exchanged.

⁸ NASA's responsibilities may be carried out by civil service employees at a NASA installation, or under contract entered into by NASA. Thus the circumstances giving rise to rights in inventions, patents and data, as well as the rights thereto that may be acquired and made available to others, can be extremely diverse. An important factor is coordination of NASA's activities performed in-house or under contract with any commitments that NASA may make to the private-sector

participant under a Space Act agreement to assure that rights have not been otherwise vested or committed. As a rule of thumb, commercial rights to inventions to which NASA has either acquired title or has the right to acquire title (from either its employees or from a contractor or grantee) may be made available to the private-sector participant under a collateral arrangement if properly coordinated in conjunction with a Space Act agreement. Any data acquired by NASA from a contractor will normally have been acquired with unlimited rights, as will data resulting from in-house activities. Thus as a general rule such data can be made available to the private-sector participant on an unrestricted (and nonexclusive) basis only.

⁹NASA Management Instruction (NMI) 8610.8, Reimbursement for Shuttle Services Provided to Non-U.S. Government Users (published in the Federal Register under Title 14, Chapter V, Subpart 1214.1, 42 FR 3829-3833, January 21, 1977) states, in paragraph 6. (a), that--"NASA will not acquire rights to inventions, patents or proprietary data privately-funded by a user, or arising out of activities for which a user has reimbursed NASA under the policies set forth herein--." The basis for this policy is an obvious corollary of the policy discussed in the memorandum cited in footnote 4. While NMI 8610.8 is specifically directed to Shuttle Services, the same rationale would apply to any reimbursable activities.

¹⁰NASA's Interim Patent Waiver Regulations, amendments to 14 CFR 1245.1 of July 1, 1981; Federal Register, Volume 48, No. 96, May 17, 1983, pgs. 22132-22133. Waiver may be requested in advance of contract for all inventions that may be made under contract, or subsequently under contract for an individual identified invention. Experience to date under these regulations is that more than 90% of the requests for waiver (of either type) are granted.

¹¹Applicable procedures and contract clauses are set forth in Subpart 27.3 of the Federal Acquisition Regulation for contracts subject to 35 U.S.C. 200-204; and in Subpart 27.3 of the NASA Supplement to the Federal Acquisition Regulation for contracts subject to section 305 of the Space Act.

¹²Public Law 98-577, the "Small Business and Federal Procurement Competition Enhancement Act of 1984," added a new section 21, relating to technical data, to the Office of Federal Procurement Policy Act, and portions thereof are applicable to all Federal Agencies. Of note is the fact that some of the provisions of Public Law 98-577 are limited to agencies subject to title III of the Federal Property and Administrative Services Act, and NASA is not one such agency. Subpart 27.4 of the NASA Supplement to the Federal Acquisition

Regulation has been structured to recognize that fact, and any future coverage in the FAR will be similarly structured.

13 To date there is no data rights coverage in the Federal Acquisition Regulation, and agencies must address the subject in their supplements to the FAR. NASA has done so in Subpart 27.4 of its supplement to the FAR, which implements those portions of Public Law 98-577 that apply to NASA, while at the same time compatible with the requirements of section 203(a)(3) of the Space Act and the Freedom of Information Act. Efforts are currently underway to provide data coverage in the FAR for all civilian agencies, including the requirements of Public Law 98-577. This coverage is expected to be derived from the NASA Supplement to the FAR.

14 This approach is set forth in Subpart 27.4 of the NASA Supplement to the FAR (18-27.473-2(f)), and may be viewed as precedent setting for procurement contracts.

15 NASA's licensing authority is based on 35 U.S.C. 207-209 and implemented by the NASA Patent Licensing Regulations, 14 CFR 1245.2 (Federal Register, Vol. 46, No. 211, Nov. 2, 1981, pgs. 54328-54331). Essentially the same authority previously existed under section 305(g) of the Space Act (42 U.S.C. 2457(g)), which was repealed and replaced by 35 U.S.C. 207-209 as of July 1, 1981. Currently NASA is granting in the order of 40 licenses per year, of which 40% are exclusive.

Mr. KEMPF. I would like now to turn to the uncertainty issue and H.R. 4316. In so doing, it is important to maintain a clear distinction between the purpose of that bill and the purposes of H.R. 3112. The issues of these two bills are not the same, and they should be kept separate and distinct.

As to the purpose of H.R. 4316, it has come to NASA's attention in recent years that there are some perceptions that there is uncertainty as to the jurisdiction, at least for patent law purposes, that applies to activities in outer space. This comes about primarily because, as a general proposition, the patent laws of most countries, including the United States, have no extraterritorial effect.

Many observers believe, however, that under present law title 35 of the United States Code applies to any space object under the jurisdiction and control of the United States. This is based on analogies that can be drawn from similar situations, where inventions that have been made or used outside the so-called geographical boundaries of the United States have been construed by the courts as having been made or used within the legal boundaries of the United States. This view is also supported by certain provisions of the Outer Space Treaty, coupled with article II of the Registration Convention. However, this view is not necessarily unanimous. I do believe it is the majority view, but not a unanimous view.

Therefore, as a further incentive for U.S. industry to invest in the commercial use of space, NASA does support an appropriate amendment to the U.S. patent laws which would provide clarity and certainty as to their applicability to activities in outer space, such as is provided in H.R. 4316. It's NASA's view in providing this support, that such an amendment would not create any substantive change in the law, but only provide clarity and certainty on this jurisdictional issue.

We previously testified in favor of the approach reflected in H.R. 2725, which was an earlier version of H.R. 4316, before the Subcommittee on Courts, Civil Liberties, and Administration of Justice of the Committee on the Judiciary, House of Representatives. We are also willing to submit a copy of that earlier testimony for the record, if the subcommittee so desires.

Mr. NELSON. It shall be a part of the record.

[The earlier testimony mentioned above follows:]

Statement of

S. Neil Hosenball
General Counsel

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

before the

Subcommittee on Courts, Civil Liberties and the
Administration of Justice
Committee on the Judiciary

U.S. House of Representatives

Mr. Chairman and Members of the Subcommittee:

Thank you for this opportunity to participate in these hearings to consider the applicability of the U.S. patent laws to activities in outer space.

On July 20, 1984, the fifteenth anniversary of the first landing of man on the surface of the moon, President Reagan publicly embraced an extremely important part of his National Policy on the Commercial Use of Space. In his remarks at a White House ceremony marking the anniversary, the President stated in part:

"I also said in that State of the Union address [January 1984] that we would soon develop initiatives to help promote private sector investment in space, and we're now embarking on that course. We'll do all we can to ensure that industry has a routine access to space and a suitable, reliable place to work there. And we'll do this without needless regulatory constraints."

There are many parts that make up the initiatives which the President has set in motion. Some are new, some are not, and some are improvements to techniques which have been developing over a period of time. Taken together, however, they provide a solid framework with which to move forward and truly stimulate the commercial use of space. In support of this Administration objective, NASA established an Office of Commercial Programs to serve as a forum for an agency-wide program to reduce the technical, financial and institutional risks of doing business in space.

Among the initiatives undertaken was an assessment of NASA's treatment of intellectual property rights as they relate to commercial use of space. In this regard, the following guideline is contained in NASA's Commercial Use of Space policy:

"NASA will continue its flexible yet realistic approach to providing maximum protection for intellectual property rights arising out of private investment, and of encouraging the use and commercialization of NASA-supported and developed technology, with patent and other protection afforded the user as applicable and appropriate."

In carrying out this initiative NASA reviewed in depth its policies and procedures, including any laws and regulations that may affect such policies and procedures, to assure that potential barriers to private risk-taking, such as lack of clarity and uncertainty, are minimized if not totally eliminated. This review indicated that for the most part NASA's policies and procedures relating to intellectual property rights, to the extent they are not affected by extramural laws over which NASA has no control, have been refined to the point where we believe that no actual barriers exist. However, one area was identified where there are some perceptions that the law is unclear and uncertain: the applicability of patent laws to activities in outer space. This is also an area over which NASA cannot exercise control by refinement of its internal policies and procedures. Rather, clarity and certainty, if needed, will have to be provided either by amendment to the United States patent laws, or by judicial interpretation of existing laws. The latter process may be time-consuming, requiring case-by-case decisions on diverse fact situations before resolution, such that it in itself may be perceived as a potential barrier.

The laws relating to inventions and patents have no extraterritorial effect, and therefore the laws of the country in which certain activities take place apply. For example, under sections 102 and 104 of title 35 of the United States Code, whether or not an invention was conceived, reduced to practice or used in the United States or a foreign country under certain circumstances, are factors to consider for patentability or in establishing priority in conflicting claims to invention. Also, under Chapter 20 of title 35, U.S. patents only protect use or manufacture only in the United States. Thus clarity and certainty as to jurisdiction over activities performed in outer space are needed in order for private risk-takers to assess their ability to obtain and/or enforce U.S. patent rights in that milieu.

Therefore NASA would support an appropriate amendment to the United States patent laws which would provide clarity and certainty as to their applicability to activities in outer space. Basically, it is our view that this could be accomplished by statutory language which would, in effect, provide that any invention conceived, reduced to practice, manufactured or used in outer space on a space vehicle or object (suitably defined) which is under the jurisdiction of the United States shall be considered conceived, reduced to practice, manufactured or used in the United States for the purposes of title 35, United States Code. Any amendment should be prospective in application only and not affect any pending litigation one way or the other.

NASA believes that such an approach is consistent with the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, January 27, 1967, TIAS 6347, 610 UNTS 205 (effective October 10, 1967). For example, Article II of the Treaty provides:

"Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."

In addition, Article VI provides:

"States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization."

Finally, Article VIII provides:

"A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain

jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return."

One interpretation of the foregoing is that given this Treaty, which essentially establishes a "free space" doctrine, the jurisdiction over legal events occurring on any object in space enures to the State Party having jurisdiction over that object. If this is the correct interpretation, the amendment to the U.S. patent laws supported by NASA would not change current patent law, but would provide certainty as to that issue. If, on the other hand, that is a doubtful interpretation, then NASA believes that such amendments would be desirable to provide both clarity and certainty on the issue.

One important practical effect of this approach would be to assure treatment of the presently operational Space Transportation System, and eventually the Space Station, as a facility in the same manner as a terrestrial-based facility is presently treated in relation to inventions and patents under title 35. NASA views these facilities as a national resource that are to be made available to a variety of users under various agreements to conduct experiments, demonstrations, and on-going commercial operations for space manufacturing. Many such agreements require substantial private investment, or total reimbursement to NASA, and clarity and certainty regarding patent rights are important to the private participant. In addition, as commercial activities in space approach maturity, an increasing number of facilities and vehicles will be placed in orbit totally with private capital with little or no Governmental involvement. In assessing all of these possibilities it is NASA's view that title 35 of the United States Code should apply equally to such facilities and vehicles irrespective of whether they are terrestrial-based or in-orbit, and regardless of whether they are governmentally or privately funded, so long as they are under the jurisdiction of the United States.

Regarding the criteria to be applied in determining whether a space vehicle or object is to be considered under United States jurisdiction or control, Article II of the

Convention on the Registration of Objects Launched into Outer Space, January 14, 1975, TIAS 8480, provides:

"1. When a space object is launched into orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain. Each launching State shall inform the Secretary-General of the United Nations of the establishment of such a registry.

2. Where there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the object in accordance with paragraph 1 of this article, bearing in mind the provisions of Article VIII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and without prejudice to appropriate agreements concluded or to be concluded among the launching States or jurisdiction and control over the space objection and over any personnel thereof.

3. The contents of each registry and the conditions under which it is maintained shall be determined by the State of registry concerned."

It is the view of NASA that registration pursuant to the Registration Convention, which has entered into force for the United States, should be taken as prima facie evidence of United States jurisdiction and control. The criteria of whether or not a space vehicle or object is under United States jurisdiction or control for the purposes of title 35 should be applied to the vehicle or object when in outer space, and not to the site of the launch activities for placing it in outer space. As to such launch activities, existing terrestrial laws should apply, recognizing that the temporary presence doctrine (see 35 U.S.C. 272 and 42 U.S.C. 2457(k)) may also be applicable to the launch.

Mr. Chairman, it has been a pleasure to come before you to discuss this important issue. NASA considers the treatment of intellectual property rights an important element of its efforts to encourage commercial use of outer space by the private sector. In our view it is highly desirable that there be clarity and certainty as to the applicability of the United States patent laws to activities on space vehicles or objects under the jurisdiction of the United States. NASA therefore would support any appropriate legislation to clarify and provide certainty in this area, with particular emphasis on the issues discussed in this statement.

Mr. KEMPF. One important difference between H.R. 2725 and H.R. 4316 that was not discussed in our earlier testimony is worthy of note, however. That is, H.R. 4316 now provides additional flexibility to enable certain international agreements to which the United States is a party to provide for other than U.S. jurisdiction for objects—and objects are defined as spacecraft or components thereof—that are specifically identified in the agreement. This flexibility, in NASA's view, is consistent with article II of the aforementioned Registration Convention, which also provides for a flexibility regarding jurisdiction when two or more launching states are involved in joint activities in outer space under the Outer Space Treaty.

I have further, for background information, if the subcommittee is interested, prepared a paper which is also available as a public document that discusses some of the issues involved in international agreements relating to proprietary rights, and I'm willing to submit that for the record.

[The paper follows:]

INTELLECTUAL PROPERTY RIGHTS AND COMMERCIAL USE OF SPACE

In refining and adjusting its policies and procedures relating to intellectual property rights to support initiatives directed toward encouraging commercial use of space, NASA has continued its flexible yet realistic approach of providing maximum protection of rights (including rights to inventions, patents, copyrights, trade secrets and confidential business information) arising out of private investment; and of managing rights arising out of NASA-supported activities in a manner that encourages the widest practicable dissemination, transfer and commercial use of the results of such activities, including affording exclusivity to a potential user as appropriate and consistent with NASA's mission objectives and program needs.

Because of the diverse nature of the various arrangements that may be possible in the evolving area of commercial use of space, as well as the varying scope of, and source of, the intellectual property rights that may arise out of or be used under any given arrangement, hard and fast procedures (except for procurement contracts and grants) are neither possible nor desirable, but the following policies and procedures are used as a guide in various arrangements with the private sector.

Space Act Agreements: Joint Endeavors and Related Activities

These agreements, founded on direct Space Act authority, are structured so that each party (NASA and the private-sector participant(s)) carry out mutually-agreed responsibilities to encourage the commercial use of space, with each party funding their own responsibilities. In agreements of this type, it is NASA policy to enable the private-sector participant to retain all right, title and interest to any inventions and resulting patents arising out of the participant's contribution to the agreement, subject to certain limited license rights and/or contingent rights NASA may acquire consistent with the mutual objectives of the agreement. Essentially such contingent rights will be structured to assure limited access to, or availability of, the involved technology for further commercialization under agreed terms and conditions in the event the participant cannot or does not carry out its responsibilities under the agreement. Additional consideration may be given to availability of the technology sufficient to meet public needs in the area of health and safety if applicable, as well as an understanding on the allocation of rights between the parties in the event of termination by either party under various circumstances. As to NASA's contribution, NASA acquires rights as applicable to the circumstances under which such rights arise, and if needed as a further incentive to the commercialization objectives of the agreement, NASA may afford the private-sector participant first option to acquire license rights, including exclusive commercial rights, if applicable.

Data furnished to NASA by a private-sector participant under the agreement is to be kept to a minimum necessary for NASA to carry out its responsibilities. To the extent such data qualifies as a trade secret or is commercial or financial and confidential or privileged, NASA will agree to limit its use, duplication and disclosure to only those purposes necessary to carry out NASA's responsibilities under the agreement. Certain contingent rights may also be obtained regarding such data, compatible with the contingent rights acquired in relation to inventions and patents. There will, in addition, be an identification and an express understanding as to certain data, of a general nature describing the activity and the overall results, which may be publicly released.

Space Act Agreements: Reimbursable Activities

These agreements, also founded on direct Space Act authority, are structured to provide, for a private-sector sponsor, certain agreed-to tasks on a reimbursable basis. Typically they are the type of agreement used to provide launch and related services for a private-sector sponsor to facilitate access to space. Under such agreements, it is NASA policy not to acquire rights to inventions or patents which may be used in, or result from, any activity for which NASA is reimbursed. In addition, data is acquired under such a reimbursable agreement only to the extent necessary for NASA to carry out its responsibilities under the agreement. Efforts are to be made to limit such data to the type of data which may be used by NASA without restriction. Again, to the extent any data furnished to NASA qualifies as a trade secret or is commercial or financial and confidential or privileged, NASA will agree to limit its use, duplication and disclosure to only those purposes necessary for NASA to perform its commitments under the agreement.

NASA Funded Activities

Activities funded by NASA (in whole or in part) are carried out under contract or grant, and the treatment of intellectual property rights thereunder is based on both the Space Act and numerous Government-wide laws, policies and standardized regulations. Basically, NASA's policies and procedures enable a contractor or grantee to request or retain first option to elect title to inventions made under contract or grant and to obtain patent protection in order to promote commercial use. This title is subject to a license for Governmental purposes, and certain march-in rights to assure that the invention is not suppressed or abandoned, consistent with Government-wide policy. NASA's policies and procedures also require prompt and effective reporting of all new technology developed under contract so that it may be made available by NASA for commercial use, consistent with the right of the contractor or grantee to elect title and obtain patent protection for commercial purposes.

NASA does not acquire under contract or grant any data relating to privately-developed technology that may constitute a trade secret, or is commercial or financial and confidential or privileged, unless there is a programmatic need for such data. When such a need exists, the data is acquired with restrictions on its use, duplication and disclosure so as not to compromise any intellectual property rights residing therein or jeopardize its commercial value. Data first produced and wholly funded under contract, if acquired, is normally acquired without restriction so that it may be used for competitive procurement or made available for dissemination and commercial use as appropriate. If the data results from co-sponsored research and development wherein the contractor is required to make substantial contributions of funds or resources (by cost-sharing or repayment of non-recurring costs), NASA will negotiate appropriate data rights to enable the contractor to protect the results of its contributions, consistent with the objectives of the contract.

Licensing of NASA-Owned Patents

NASA actively licenses patents on inventions arising out of NASA-supported research and development, and with respect to which NASA has acquired title, for the purpose of fostering commercial utilization of such inventions. Exclusive, partially exclusive and nonexclusive licenses are available depending on the circumstances. These licenses may be to practice the patented invention, only, or may be coupled with or in support of technical assistance arrangements or collateral Space Act agreements (such as joint endeavors or related activities) structured to obtain commercial use of the involved technology.

Mr. KEMPF. In conclusion, it is NASA's assessment that H.R. 4316, if enacted, will be beneficial not only to NASA's activities relating to the commercial use of space, but also to the private sector investing in such activities.

This concludes, Mr. Chairman, my oral comments, and it has been a pleasure to comment on these matters. We are willing to answer any further questions and provide any followup information, and also we encourage other analysis and other points of view if they will help resolve what we consider to be a very important issue.

[The prepared statement of Mr. Kempf follows:]

Statement of

Robert F. Kempf
Associate General Counsel
(Intellectual Property)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

before the

Subcommittee on Space Science and Applications
Committee on Science and Technology

U.S. House of Representatives

Mr. Chairman and Members of the Subcommittee:

Thank you for this opportunity to participate in these hearings with respect to two bills which address the applicability of United States patent laws to activities occurring in outer space: H.R. 3112 and H.R. 4316.

NASA considers all aspects of intellectual property law, including laws relating to patents and inventions, irrespective of whether such laws apply to activities occurring in inner space or outer space, to be a very important factor in carrying out the United States space program. The importance of such laws is equally shared, we believe, by the U.S. private sector--as it should be in that appropriate and adequate protection of intellectual property rights is also an important consideration in private efforts relating to commercial use of space by United States industry. Thus NASA is continuously analyzing its present policies, procedures and practices in the context of present laws, and assessing any need to change those laws, to assure that such protection is adequate within the framework of the overall legal regime affecting intellectual property rights for all sectors of the U.S., private and public. It is believed that this overall approach is needed in that, by its very nature, NASA's involvement in the commercial use of space is intended to encourage and foster private ventures, such that eventually the body of intellectual property law that applies to solely private relationships may control. In order to avoid discontinuities in the transition to private activities, there should not be a different body of law unique to either NASA's activities or activities conducted in outer space. As a practical matter, most legally relevant events affecting intellectual property rights will transcend the interfaces between the public and private sectors, as well

as the artificial boundaries between inner space and outer space.

NASA's analysis of the adequacy of present laws in relation to commercial use of space, and the assessment of any need for change, has been approached from two perspectives: the substantive protection afforded by any legal regime (such as the proposed changes to the laws relating to inventions made in outer space as reflected in H.R. 3112); and clarity and certainty as to how existing law will be applied to any activities relating to the commercial use of space that may be conducted in outer space (as provided by H.R. 4316). The results thereof are set forth below.

THE SUBSTANTIVE LAW AND H.R. 3112

As to the substantive protection available to the private sector investing in commercial use of space, it is NASA's assessment that the present law is (or should be if properly applied) adequate for outer space in the same manner that it is adequate for any similar inner space or terrestrial activity. If, however, present law is deemed inadequate if applied to outer space, the matter should be approached generically, with particular regard for its affect on solely private relationships, including the affect on the common law regarding ownership of inventions and title 35 of the United States Code regarding inventorship.

In considering this assessment, it is crucial to note that in developing its present policies under existing law, NASA has made a clear and important distinction between inventions made or used in privately-funded activities (such as by a private participant carrying out its responsibilities under a joint endeavor agreement, technical exchange agreement, reimbursable agreement, or related activity); and inventions that are made or used in performing work for NASA under contract or grant. In the former situation laws relating to the disposition of rights to inventions for Federally-funded activities do not apply; but rather, basic common law principles and title 35, United States Code (except Chapter 18), apply in the same manner that they are applied by private parties in a non-Federally funded activity in any similar inner space or terrestrial arrangement. Thus if any changes in the law are made on the basis of whether or not such commercial-use activities are carried out in outer space rather than inner space, it would have to be by changing existing common law principles and title 35 (except Chapter 18) as applied to all similar private sector activities. NASA does not believe that this is needed, desirable, or in some instances even workable.

As to inventions made or used in the performance of work for NASA under contract or grant, NASA follows the same policies as all other Federal agencies (consistent with Chapter 18 of title 35 of the United States Code) to the extent permitted by law. The only law that requires NASA to do otherwise (at least procedurally) is Section 305 of the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2457). Under Section 305, NASA acquires title to inventions made in the performance of work under a NASA contract with other than a small business firm or nonprofit organization unless title is waived when it is determined to be in the interests of the United States to do so. In making its waiver determinations, NASA has adopted the Presidential Memorandum on Government Patent Policy of February 18, 1983. As a result, NASA waives title to contractors under the same circumstances, and subject to the same conditions, as are applicable to contractors electing title in similar funding agreements with other agencies. This provides uniformity in substantive result, with the only difference being procedural. This result is achieved irrespective of whether or not any invention subject to Section 305 is made in inner space or outer space. Whether or not changes to this established policy are needed or desirable for any Federally-funded inventions made in outer space is, in NASA's view, a Government-wide patent policy issue that should be considered in the context of Chapter 18 of title 35, United States Code, and the Presidential Memorandum on Government Patent Policy. That issue, however, is separate and distinct from NASA policies and procedures relating to inventions made by a private participant under an agreement relating to commercial use of space in that such agreements are not funding agreements of the type that are subject to Chapter 18, the Presidential Memorandum or Section 305 of the Space Act, in the first instance.

A more detailed discussion of the potential impact of H.R. 3112 on NASA's established policies, procedures and practices under present law is set forth below.

1. H.R. 3112 will interject unneeded and potentially conflicting changes in the law regarding NASA's policies and procedures for joint endeavors, technical exchange agreements, reimbursable agreements, and related activities.

First, H.R. 3112 appears to treat joint endeavors, technical exchange agreements, reimbursable agreements, and related activities as if they were sui generis with Federally-funded contracts and grants. It is not clear whether this was done because it is assumed (contrary to fact and law) that joint endeavors, technical exchange agreements, reimbursable agreements, and related activities are now subject

to 42 U.S.C. 2457 and/or 35 U.S.C. 200-204, and accordingly that problem needs to be "fixed," or because, for some reason, it is perceived that the common law principles as applied by NASA are inadequate and therefore need to be addressed by statute. In any event, H.R. 3112 confuses and may cast doubt on NASA's long-standing policies and procedures in this regard rather than providing any clarity or simplicity.

Another area of conflict and/or complexity that will be created stems from the fact that H.R. 3112 applies only to the physical location where an invention is made (outer space), and not to the legal relationship of the parties and/or the funding parameters of the agreement in accordance with established principles. The advantage of keying policies to the relationship of the parties and/or the funding parameters of the agreement is that these are facts that are known at the time an agreement is entered into. Facts surrounding the "making" of an invention are not known, of course, until an invention is actually made, and even then can be rather difficult to sort out. For example, space-related activities conducted under a joint endeavor, or technical exchange, or reimbursable agreement, or under a Federally-funded contract or grant, are not conducted solely in outer space, and as a practical matter inventions are as likely to be "made" on earth as in outer space under the same agreement. Thus two sets of policies and procedures may be necessary between the same parties having the same legal relationship in any given agreement: one for inventions made in outer space under H.R. 3112; and one for inventions made in inner space (which, by definition, are not under H.R. 3112). This later set, in turn, may require another subset depending on whether the inventions are Federally funded or privately funded. In any event, the status of an invention (i.e. whether it is an outer space invention or an inner space invention) will, in all probability, have to be deferred until after it is made, thus interjecting uncertainty at the time of agreement, and introducing complicated facts to contend with at the alleged time of making the invention.

Further, as to those inventions determined to be made in outer space (which determination will, as indicated, have to be an after-the-fact determination often based on complicated fact situations), the minimum rights retained by NASA as set forth in H.R. 3112 may be either a standard license for Governmental purposes, or no rights at all (with no stated criteria as to the applicability of either). This standard license, in turn, is the one normally acquired by the Government in procurement contracts wherein the Government funds research and development work for use by or for the Government. While suitable for procurement or acquisition needs for Federally-funded

inventions, it is not necessarily appropriate for the commercial objectives of a joint endeavor or a technical exchange agreement. Also, NASA obtains no license at all under reimbursable agreements. Thus the choice between this license or none at all, without the flexibility to negotiate contingent rights somewhere in between and better suited to the respective contributions and the commercial use objectives of the parties in any given agreement, creates a departure from NASA's established policies in this regard.

Additionally, under H.R. 3112 it is totally unclear as to who the real party in interest is regarding the ownership of inventions made in outer space. One interpretation of H.R. 3112 would require title to any invention made in outer space to vest in the "inventor" as an individual, with the right of that individual to assign to others at least questionable. For example, H.R. 3112 precludes the right of the "inventor" from being "waived or abrogated" by any contract or other arrangement between the inventor and a Federal agency. However, as a practical matter contracts and agreements of Federal agencies are not with inventors, but with the employing organization of an inventor who has, or is required to have, an agreement to assign ownership to the employer. Yet H.R. 3112 does not appear to be applicable to any ownership rights of such organizations if in fact assignment from the inventor to such organization is permissible and/or has taken place. Rather, H.R. 3112 can be interpreted to apply only those rights retained by the inventor, which could be nonexistent if assignment is permissible or has in fact occurred. Consequently, it is confusing and ambiguous as to who the real party in interest is as to ownership rights to inventions made in outer space, but H.R. 3112 can be interpreted to conflict with normal contracting practices as well as the common law relating to the right of private employing organizations to obtain assignment of inventions made by their employees.

Finally, it is to be noted that H.R. 3112 will also apply to inventions made in outer space by Federal employees and military personnel, even in the course of official or assigned duties, and will vest title to such invention in the employee notwithstanding Executive Order 10096. The prohibition against assignment in section 222, if nothing else, appears to absolutely preclude the Federal Government from acquiring assignment from its employees. This would, in turn, preclude NASA or any other Government agency from obtaining patents on and licensing or otherwise making such inventions available to a private-sector participant under a joint endeavor, technical exchange or reimbursable agreement, or licensing a third party willing to make commercial use of the invention. Under present policies and procedures all agencies acquire rights to such

inventions under the criteria set forth in Executive Order 10096, as appropriate obtain patents thereon, and license them to the private sector for commercial use. No reason is seen why a different policy should be applied to inventions made by Federal employees and military personnel in outer space than for that which presently applies to those made in inner space.

2. H.R. 3112 will create constraints that could have an adverse effect on the treatment of invention rights in international agreements.

Experience of NASA and other agencies in negotiating international agreements for cooperative research and development activities over the years indicates that in many instances it is necessary for the U.S. Government to have the flexibility and the ability to grant licenses of varying scope and/or to assign foreign rights to inventions made in the course of the agreement to the foreign participant, at least in the participant's country, and at times in third countries. A license of the scope set forth in section 223 of H.R. 3112 is often inadequate in these situations. This fact was dramatically illustrated when 35 U.S.C. 200-204 was enacted with a license right of essentially the same scope as set forth in section 223 of H.R. 3112 for Federally-funded inventions, with no flexibility for an agency to retain needed foreign rights except through the time-consuming "exceptional circumstances" process (which possibility does not even exist under H.R. 3112). Consequently several agencies, for expediency, interpreted in their implementing regulations such license to also mean either an exclusive license or even assignment of title in the country involved. Subsequently, 35 U.S.C. 200-204 was amended (Pub. L. 98-620) to correct this deficiency.

This problem does not now exist for NASA, irrespective of whether the inventions in question may arise under a joint endeavor, technical exchange, or related agreement; may be made under a contract or grant subject to 42 U.S.C. 2457 or 35 U.S.C. 200-204; or may be made by a NASA employee under Executive Order 10096. Thus provisions relating to inventions and patents can be treated with a great deal of flexibility in international agreements. The problem will, however, be interjected across the board for all inventions made in outer space under H.R. 3112, irrespective of the type of agreement under which the invention may be made, with no flexibility regarding title in foreign countries.

3. H.R. 3112 provides for ad hoc treatment of rights to Federally-funded inventions in a manner inconsistent with established Government-wide policies.

NASA supports, and practices, the principal that in most instances contractors and grantees should be afforded the first option to title to inventions made under Federally-funded contract or grant. Great strides have been made in this area, such that presently under 35 U.S.C. 200-204 for small business firms and nonprofit organizations, and under the 1983 Presidential Memorandum (which adopts the policy of 35 U.S.C. 200-204 for all other contractors), substantial uniformity has been achieved by all agencies (including NASA under section 305 of the Space Act). Thus to the extent H.R. 3112 is intended to substantively address the "first option" in the contractor or grantee policy for inventions made with Federal funding in outer space, it is unneeded.

In addition, this Government-wide policy also includes a number of assurances that Federally-funded inventions are made reasonably available for commercial use and not suppressed or abandoned by the contractor or grantee, as well as adequate flexibility to enable an agency to obtain title as needed for national security reasons, if needed for international agreements, or in exceptional circumstances in furtherance of mission needs. Neither these assurances nor this flexibility are present in H.R. 3112.

For example, under present Government-wide policy a contractor or grantee is required to identify, report, elect title, and file a patent application on an invention made under contract or grant within a reasonable time. Also, when a contractor or grantee does elect title and file a patent application, a number of "march-in" rights apply to assure that the invention is not suppressed or abandoned. Further, the Government has a "second option" to obtain title when a contractor is not interested in commercializing the invention. Such requirements are carefully structured and applied to recognize, and not to prejudice, the contractor's right to elect title to inventions which the contractor intends to commercialize, while at the same time assuring that inventions which the contractor does not intend to commercialize are not suppressed or abandoned.

H.R. 3112, on the other hand, contains no requirements that the "inventor" in whom title vests has any requirement to report or disclose an invention to the funding agency, file any patent applications, or to take any actions to assure that the invention will not be suppressed or abandoned. Also, it is

highly questionable whether the Government has "second option" to acquire title if the "inventor" is not interested in the invention. No reason is seen why different requirements are needed for inventions made with Federal funding in outer space as distinguished from inner space. If, however, any changes are needed they should be considered Government-wide for all Federally-funded inventions, and not on an ad hoc basis based on environmental setting. Otherwise the progress that has been made to achieve uniformity and consistency of result will be disrupted.

THE UNCERTAINTY ISSUE AND H.R. 4316

Irrespective of what substantive law does, or should apply, to inventions made or used in outer space, it has come to NASA's attention in recent years that there are some perceptions that there is uncertainty as to the jurisdiction, at least for patent law purposes, that applies to activities in outer space. This comes about primarily because as a general proposition the patent laws of most countries, including the United States, have no extraterritorial affect. Many observers believe, however, that under present law title 35 of the United States Code applies to any space object under United States jurisdiction or control. This is based on analogies that can be drawn from similar situations where inventions that have been made or used outside the "geographical" boundaries of the United States have been construed as made or used within the "legal" boundaries of the United States; and/or because of the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial Bodies (January 27, 1967, TIAS 6347, 610 UNTS 205, effective October 10, 1967), coupled with Article II of the Convention on the Registration of Objects Launched into Outer Space (January 14, 1975, TIAS 8480). This view, however, is not necessarily unanimous. Therefore, as a further incentive for U.S. industry to invest in the commercial use of space, NASA supports an appropriate amendment to the United States patent laws which would provide clarity and certainty as to their applicability to activities in outer space, such as provided by H.R. 4316. It is NASA's view that such amendment would not create any substantive change in the law, but only provide clarity and certainty on this jurisdictional issue. It is also believed that if enacted, H.R. 4316 should be prospective in application, only. NASA has previously testified in favor of the approach reflected in H.R. 2725 (an earlier version of H.R. 4316) before the Subcommittee on Courts, Civil Liberties and the Administration of Justice, Committee on the Judiciary, U.S. House of Representatives. We are willing to submit a copy of that earlier testimony for the record.

One important difference between H.R. 2725 and H.R. 4316, not discussed in NASA's earlier testimony, is worthy of note, however. That is, H.R. 4316 provides additional flexibility to enable certain international agreements to which the United States is a party to provide for other than United States jurisdiction for objects (spacecraft or components thereof) identified in the agreement. This flexibility, in NASA's view, is consistent with Article II of the aforementioned Registration Convention, which also provides for flexibility regarding jurisdiction when two or more launching States are involved in joint activities in outer space under the Outer Space Treaty.

It is therefore NASA's assessment that H.R. 4316, if enacted, will be beneficial not only to NASA's activities relating to commercial use of space, but also to the private sector investing in such activities.

Mr. Chairman, it has been a pleasure to come before you to discuss this important subject matter. Our analysis indicates that except for a possible need for clarity and certainty as to the applicability of the United States patent laws to activities on space vehicles or objects under the jurisdiction or control of the United States, there are adequate laws, policies, procedures, and practices available to NASA to assure protection of proprietary rights arising out of activities relating to the commercial use of space. NASA is open to other analysis, however, and is willing to work with the Subcommittee and answer further questions, in order to seek needed resolution of any outstanding issues.

Mr. NELSON. Thank you, Mr. Kempf.
Mr. Kirk.

**STATEMENT OF MICHAEL K. KIRK, ASSISTANT COMMISSIONER
FOR EXTERNAL AFFAIRS, PATENT AND TRADEMARK OFFICE,
DEPARTMENT OF COMMERCE, WASHINGTON, DC**

Mr. KIRK. Thank you, Mr. Chairman. I, too, welcome this opportunity to testify on the subject of inventions in outer space.

H.R. 3112 addresses the allocation of ownership of inventions resulting from activities in outer space, while H.R. 4316 would clarify the applicability of U.S. patent law to inventions made or used in outer space. These two bills are very different, and I will address them separately.

Until very recently, activities in outer space were largely carried out by governmental agencies; commercial ventures were simply too risky an investment. However, investment by the private sector in outer space is increasing, and the administration would like to encourage this investment.

One way to maintain incentives for the private sector and to reduce the financial risk of commercial space activities is to ensure adequate protection for intellectual property. For industry, uncertainty of patent rights is nearly as detrimental to the incentive to invest in research and development as the absence of protection. Before making large investments in high-risk activities, our industry needs assurance regarding the applicability of our patent law to space vehicles under U.S. jurisdiction.

I believe that a proper judicial interpretation of U.S. laws and of the treaties to which the United States is a party would hold that our patent law applies to vehicles under U.S. jurisdiction and control. We recognize, as you pointed out, Mr. Chairman, that there is dispute on this matter, and that dispute raises doubt in the minds of U.S. industry.

Litigation is too protracted and too expensive and without assured results, and for this reason we fully support the goals of H.R. 4316.

H.R. 4316 also gives the United States flexibility when entering into international agreements, as mentioned by Mr. Kempf. It's needed flexibility, and it allows for the precise tailoring of all parties' interests regarding the protection of intellectual property in outer space without placing the United States in a legal straitjacket.

Turning now to H.R. 3112, we support its stated objective but believe that it fails to accomplish this goal. H.R. 3112 would provide that any invention made in outer space would be the exclusive property of the inventor, regardless of whether it was made with Federal or private assistance.

Though limited to the narrow sphere of activities in outer space, the provisions in H.R. 3112 would require significant changes in contracting and employment practices for both the Federal Government and private industry. Under U.S. law, the rights to an invention belong to the inventor unless he agrees to transfer those rights. By long-standing practice, this may be done in advance of making the invention. In most companies relying heavily upon re-

search and development activity, employees agree in advance to assign this ownership to their employers in return for salaries and other benefits, often including significant cash awards. Enactment of H.R. 3112 would interfere with these relationships to the extent that the activities were conducted in outer space.

For the activities of business concerns funded by the Federal Government, we prefer the approach set forth in President Reagan's memorandum of February 18, 1983, on Government patent policy. A copy of this statement is appended to my prepared statement which was submitted for the record.

In addition, H.R. 3112 appears to cover inventions made in outer space both by Government and private employees in the course of their assigned duties. This would seem to preclude the Federal Government and private employers from requiring assignment of inventions by their employees and instead vest title in the employees. Such a policy would conflict with the present policy established by Executive Order 10096, common law, and several State statutes that have been enacted in this area, but only as to activities arising from outer space activities.

For these reasons, we would not support H.R. 3112 in its present form.

Thank you, Mr. Chairman. I'd be happy to answer any questions.
[The prepared statement of Mr. Kirk follows:]

STATEMENT OF MICHAEL K. KIRK
 ASSISTANT COMMISSIONER FOR EXTERNAL AFFAIRS
 UNITED STATES PATENT AND TRADEMARK OFFICE
 BEFORE THE
 SUBCOMMITTEE ON SPACE SCIENCE AND
 APPLICATIONS
 OF THE
 COMMITTEE ON SCIENCE AND TECHNOLOGY
 U.S. HOUSE OF REPRESENTATIVES

H.R. 3112 AND H.R. 4316

AUGUST 12, 1986

Mr. Chairman and Members of the Subcommittee:

I welcome this opportunity to testify on the subject of inventions in outer space. H.R. 3112 addresses the ownership of inventions resulting from activities in outer space. H.R. 4316 would clarify the applicability of United States patent law to inventions made or used in outer space. These two bills are very different, and I will address them separately.

Until very recently, activities in outer space were largely carried out by governmental agencies. Commercial ventures were simply too risky an investment. However, investment by the private sector in outer space is increasing and the Administration would like to encourage such investment. One way to maintain incentives for the private sector and reduce the risk of commercial space activities is to ensure adequate protection for intellectual property.

For industry, uncertainty of patent rights is nearly as detrimental to the incentive to commit resources for research and development

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as the absence of protection. . Before making large investments in high risk space activities, our industry needs assurance regarding the applicability of our patent law to space vehicles under United States jurisdiction. We believe that a judicial interpretation of U.S. laws, and of treaties to which the United States is a party, would hold that our patent law applies on vehicles of United States registry. However, relegating this issue to time-consuming judicial interpretation would subject industry to expensive litigation with case-by-case determinations based on individual fact situations. The time and expense required to obtain legal certainty under these circumstances pose a potential disincentive to research and development in outer space. And because the result of such litigation cannot be assured, our industry deserves the certainty that can be provided by legislation.

Consequently, we support amendment of the patent law to provide clarity and certainty regarding its applicability to activities in outer space. H.R. 4316 would provide this certainty by declaring that any invention made or used in outer space on an aeronautical or space vehicle under the jurisdiction or control of the United States would be considered made or used within the United States for purposes of the patent law. The bill wisely permits exceptions by international agreement to which the United States is a party. We believe, however, that H.R. 4316 should only be prospective in application.

Patent issues in outer space should be treated no differently from patent issues on Earth. Facilities in space under the jurisdiction or control of the United States should be subject to the same patent laws as Earth-bound facilities. The provisions of H.R. 4316 would clarify for industry that our patent

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law applies to objects in outer space which are under our jurisdiction or control. This should resolve any doubts regarding the legal status of certain activities occurring in outer space.

As a technical point, H.R. 4316 appears to cover the conception, reduction to practice, manufacture or use of an invention in outer space. It does not appear to include the possibility of an unauthorized sale as an infringement of a patent. Although we would prefer no technical distinctions between Earth-based and space-based activities, we believe this omission poses no significant problem for the foreseeable future.

H.R. 4316 gives the United States flexibility when entering into international agreements. The 1975 Convention on the Registration of Objects Launched into Outer Space provides for the registration of objects to establish jurisdiction and control over such objects pursuant to Article VIII of the Outer Space Treaty of 1967. If the United States were to enter into a joint or cooperative agreement with another country, Article II of the Registration Convention permits agreement as to the jurisdiction governing activities in the space vehicle in question. The participating countries could agree to apply the law of a single country, a composite of several laws, or the law of each country in the component it furnished. This flexibility is needed when cooperating with other states in outer space because it allows for the precise tailoring of all parties' needs regarding the protection of intellectual property without placing the United States in a legal straight jacket.

Turning to H.R. 3112, we support its stated objective, but believe that it fails to achieve that goal. H.R. 3112 would provide that any invention made in outer space would be the exclusive property

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of the inventor, regardless of whether it was made with Federal or private assistance. This provision would prevent an inventor from agreeing in advance to assign patent rights either to the Government or to a private enterprise employing the inventor. Where the invention was made substantially at Federal expense, an agency would be permitted to reserve a license for the Government. The bill would also amend the Space Act to be consistent with these provisions.

H.R. 3112 would require radical changes in contracting and employment practices. Under U.S. law, rights to an invention belong to the inventor unless he agrees to transfer those rights. By long-standing practice, this may be done in advance of making the invention. In most companies that rely heavily on research, employees agree in advance to assign ownership of their inventions to their employers. The inventors are compensated by salaries and other benefits, which often include cash awards. Enactment of H.R. 3112 would interfere with these relationships to the extent that activities were conducted in outer space. Businesses with both Earth-based and space-based activities would have to create new policies for their space-related activities.

Where Government funding of private contractors is involved, we strongly prefer the approach set forth in President Reagan's Memorandum of February 18, 1983, on Government patent policy. A copy is appended to my statement. In this Memorandum, the President directed executive departments and agencies to apply, to the extent permitted by law, the same patent policy to all Federally-funded research and development funding agreements as that applied to small business firms and non-profit organizations under title 35 of the United States Code. Under those provisions, contractors are required to report inventions to

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the Government, and may retain title to them if they so choose. The Government receives a nonexclusive worldwide license and, to the extent the contractor does not exercise its rights, the Government must be given an opportunity to secure patents on the invention. In view of the substantial investment to bring most inventions to the market, we believe that this policy encourages innovative space enterprises and provides appropriate incentives for investment in commercial space ventures.

H.R. 3112 also appears to cover inventions made in outer space by Federal employees and military personnel in the course of their official duties, and extends even to inventions made in outer space by employees of business concerns having no relationship with the Government. This would preclude the Federal Government and private business concerns from requiring assignment of inventions by their employees and, instead, vest title in their employees. Such a policy would conflict with the present policy established by Executive Order 10096, state statutes and common law regarding the allocation of rights to inventions, but only as to inventions arising from outer space activities. As a consequence, H.R. 3112 would establish different policies, depending upon where an invention was made. We believe this approach to be unwise and, therefore, would oppose H.R. 3112 in its present form.

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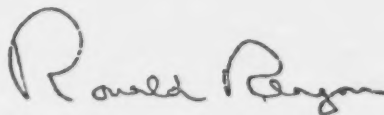
THE WHITE HOUSE
WASHINGTON
February 18, 1983

MEMORANDUM TO THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES
SUBJECT: GOVERNMENT PATENT POLICY

To the extent permitted by law, agency policy with respect to the disposition of any invention made in the performance of a federally-funded research and development contract, grant or cooperative agreement award shall be the same or substantially the same as applied to small business firms and nonprofit organizations under Chapter 38 of Title 35 of the United States Code.

In awards not subject to Chapter 38 of Title 35 of the United States Code, any of the rights of the Government or obligations of the performer described in 35 U.S.C. 202-204 may be waived or omitted if the agency determines (1) that the interests of the United States and the general public will be better served thereby as, for example, where this is necessary to obtain a uniquely or highly qualified performer; or (2) that the award involves co-sponsored, cost sharing, or joint venture research and development, and the performer, co-sponsor or joint venturer is making substantial contribution of funds, facilities or equipment to the work performed under the award.

In addition, agencies should protect the confidentiality of invention disclosure, patent applications and utilization reports required in performance or in consequence of awards to the extent permitted by 35 U.S.C. 205 or other applicable laws.

Ronald Reagan

THE WHITE HOUSE
Office of the Press Secretary

For Immediate Release

February 18, 1983

FACT SHEET

President Reagan has today signed a Memorandum to the heads of executive departments and agencies directing, to the extent permitted by law, a revision of the current policy with respect to rights in inventions made during performance of Government research and development contracts, grants or cooperative agreements. This Memorandum directs the agencies to adopt and implement the same or substantially the same policies for all R&D contractors as those set forth in Public Law 96-517 (Chapter 38 of Title 35 of the United States Code) for small businesses and nonprofit organizations. It is intended to achieve more uniform and effective Government-wide policies.

Inventions developed under Government support constitute a valuable national resource. With appropriate incentives, many of these inventions will be further developed commercially by the private sector. The new products and processes that result will improve the productivity of the U.S. economy, create new jobs, and improve the position of the U.S. in world trade. The policy established by the Memorandum is designed to provide such incentives.

Experience has shown that, in most instances, allowing inventing organizations to retain title to inventions made with Federal support is the best incentive to obtain the risk capital necessary to develop technological innovations. The new policy provides that, with limited exceptions, the inventing organizations may retain title to the invention, subject to license rights in the Government which will enable the Government to use the invention in its own programs. The Government will also normally retain the right to "march-in" and require licensing when the inventing organization fails to pursue development of the invention. In addition, the Department of Justice will develop an appropriate safeguard against anticompetitive retentions of title by organizations not subject to Public Law 96-517.

To the extent permitted by law, this Memorandum is applicable to all statutory programs including those that provide that inventions be made available to the public. Those agencies, such as National Aeronautics and Space Administration and the Department of Energy, which continue to operate under statutes which are inconsistent in respects with the Memorandum, are expected to make maximum use of the flexibility available to them to comply with the provisions and spirit of the Memorandum.

In order to promote uniformity, President Reagan has also asked the Director of the Office of Science and Technology Policy through the Federal Coordinating Council for Science, Engineering and Technology to evaluate the effectiveness of the implementation of the Memorandum and make recommendations for revision or modification of the Memorandum, OMB Circular A-124, the Federal Acquisition Regulation, or agency regulations, policies, or practices. The agencies will also provide the Council with data on the disposition and utilization of inventions resulting from their programs and on their use of patent rights clauses, exceptions and waiver authorities.

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BIOGRAPHY

MICHAEL K. KIRK

ASSISTANT COMMISSIONER FOR EXTERNAL AFFAIRS

UNITED STATES PATENT AND TRADEMARK OFFICE

Michael K. Kirk was appointed Assistant Commissioner for External Affairs on April 8, 1982. In this position he directs the Office of Legislation and International Affairs, the Office of Public Affairs, and Congressional Liaison.

From 1972 to 1982 he was Director of the Office of Legislation and International Affairs where he was involved in a number of significant legislative efforts. He headed and served on a number of U.S. delegations to various international conferences held by the World Intellectual Property Organization, the United Nations Conference on Trade and Development, and others.

From 1970 to 1972 he served as Special Assistant to the Commissioner of Patents and as a Legislative Specialist from 1967 to 1970.

From 1965 to 1967 he was a patent attorney for NASA and a Patent Office examiner from 1962 to 1965.

He is a member of the Virginia Bar and admitted to practice before the Court of Appeals for the Federal Circuit.

Mr. Kirk was born in Jacksonville, Florida, on November 13, 1937. He received a B.S. in Electrical Engineering in 1959 from The Citadel, Charleston, S.C., a J.D. from Georgetown University Law Center in 1965, and a Master of Public Administration from Indiana University in 1969.

He has been active in the American Bar Association, the American Intellectual Patent Law Association, and the Licensing Executives Society and is currently on the Council of the ABA's Section of Patent, Trademark and Copyright Law.

Mr. Kirk is married to the former Mary Catherine Everett of Silver Spring, MD., and resides in Lorton, Va. He is the father of a son David, and a daughter Tracy.

Mr. NELSON. And you do support H.R. 4316?

Mr. KIRK. Yes, sir, we do.

Mr. NELSON. Dr. Krogh.

**STATEMENT OF DR. LESTER C. KROGH, VICE PRESIDENT,
RESEARCH AND DEVELOPMENT, 3M CO., ST. PAUL, MN**

Dr. KROGH. Mr. Chairman and members of the subcommittee, I welcome the opportunity to participate in this hearing to present 3M's views on the application of the U.S. patent laws to outer space.

You know that outer space is mankind's new frontier. It has opened up vast new horizons for us, including the access to nearly perfect vacuum and micro-gravity, and the fact that we have many satellites has completely altered the way in which we communicate as a Nation and as a world.

I'm pleased to be representing the space effort in the National Research Council's Space Applications Board, and I want to comment on the fact that this new environment which we have in space holds a lot of opportunity for new inventions, to inventions made here on earth which will be used and perhaps sold in space, inventions made in space which may be made and sold there, and used, or which may be used and sold on the face of the Earth. So we expect that a lot of inventions will be made not only in helping us get into space but also as a result of space research.

I'm going to comment a little bit about the company I represent. We're in excess of \$8 billion sales, we're a multinational, we employ 85,000 people in 49 countries around the world, and we have an R&D budget of 6.5 percent to sales, a little over a half a billion dollars annually. We have long served our customers with a broad range of innovative, high quality products, and we have 25 percent of our sales in any given year are products we introduced in the last 5 years. We have four major business sectors, industrial and consumer, electronic and information technologies, life sciences, and graphic technologies.

One of the things we are characterized by is our ability to build new businesses, and we have been able, through doing that, through entrepreneurial effort, to exceed the normal average growth and profitability of the economies and industries in which we participate.

We were among the first major companies to negotiate with NASA for a joint endeavor agreement. We did so because our technical family asked General Abrahamson, Storey Musgrave, and Bob Naumann to make a presentation on the NASA space effort, including research in space. We filled our auditorium to overflowing, over 2,500 of our laboratory people attended, and, as a result, we were on our way into space some 8 to 9 months later.

We have served through most of our first 2-year joint endeavor agreement with NASA, and we're presently close to finishing negotiations for a 10-year agreement covering 60 or more flight experiment opportunities over that period of time.

Three experiments have been sent up into space, two on crystallization of organic materials, and one on the vapor phase transport of organic solids, and while we deplore the accident which de-

stroyed *Challenger*, the time in which we have not been able to get into space has been very, very valuable, because we have learned so much in those first three experiments that the time has been very valuable in designing the ones we expect to send up when the shuttle flies again.

Let me comment about the two bills which we are considering today, H.R. 3112 and H.R. 4316. These proposed bills, as has been stated, are quite different in their content. H.R. 3112 relates to ownership of inventions made in outer space. H.R. 4316 relates to jurisdiction of inventions in outer space by the United States.

Let me comment that one of the driving forces for 3M to explore micro-gravity research is simply to learn, to perhaps have patentable items, to have more intellectual property which can be of help to us in our Earth-bound research or in future space research, and we certainly applaud the intent of these bills in giving more certainty to the industrial community for the protection of the intellectual property they may produce.

With respect to H.R. 3112, this bill has a laudable purpose of vesting ownership in inventions made in outer space in the inventors, but we believe the bill to be premature. It focuses solely on the outer space locus of the inventive act for determining inventorship rights. But, more importantly, there are other, broader-based bills pending relating to Federal policies on inventors' rights—for example, S. 64 and H.R. 3773—which should be addressed for consistency and good order before taking this bill up for consideration and as a resolution of these bills will undoubtedly influence the language of this bill.

Therefore, for this and other reasons we do not support consideration for passage of H.R. 3112 at this time.

With respect to H.R. 4316, we support the bill. As stated previously, it closely parallels H.R. 2725, differing only therefrom by excepting from the bill any space vehicle or component specifically identified and otherwise provided for by an international agreement to which the United States is a party.

This bill is, we believe, an affirmation of the present patent laws as they extend to outer space. We believe, however, the words "made or used" should be changed to "made, used, or sold" or with the proper antecedents of "products made, used, or sold" wherever they appear in the bill. Simply because the possibility of sales occurring in outer space may seem to be remote is no reason to exclude them from being acts of infringement because they occur in outer space. Such sales have always constituted infringement under title 35 of the United States Code.

I hope this statement provides useful information to you and the others on the subcommittee, and thank you for the opportunity of appearing.

[The prepared statement of Dr. Krogh follows:]

STATEMENT OF LESTER C. KROGH, VICE PRESIDENT OF RESEARCH AND
DEVELOPMENT, MINNESOTA MINING AND MANUFACTURING COMPANY (3M)

Mr. Chairman and Members of the Subcommittee, I welcome the opportunity to participate in this hearing and present 3M's views on the application of the U.S. patent laws to outer space.

Outer space is mankind's new frontier. We have penetrated it and our horizons have been forever expanded. With its vast expanse, near-perfect vacuum and microgravity, outer space presents a whole new environment for mankind to explore and learn to live with. Our ability to move into and out of outer space at will was clearly established when the first man landed on the moon on July 20, 1969. We, along with other nations, have been busily placing objects in orbit around the earth and sending space vehicles on multi-year journeys to send back information on other planets in our solar system. Mankind has the knowledge that will clearly permit the building and occupation of permanent structures in outer space and the laws of the nations owning such facilities must be adapted and harmonized to accommodate mankind's existence in this new environment.

There exists great hope that this new environment will enable us to do better many things we now do in earth's environment. New inventions are now being made on earth -- and will continue to be so made -- to enable us to inhabit and travel and work in space. There is also great expectation that new inventions will be made and practiced in space and that patented products and processes on inventions so made will also be sold in space. 3M is a U.S. multinational corporation having current sales in excess of eight billion dollars per year, employing more than 85,000 people in 49 countries, serving customers with a broad range of innovative, high-quality products and services throughout the world. 3M's businesses are organized into four sectors; Industrial and Consumer, Electronic and Information Technologies, Life Sciences, and Graphic Technologies.

A hallmark of 3M is its ability to build businesses. This skill has helped the company to outperform the economies it serves and has led to above average growth and profitability. 3M was among the first companies to enter into negotiations with NASA for a long term joint endeavor agreement to conduct experiments in outer space on the U.S. space shuttles. We remain deeply committed to this endeavor and believe the disaster which occurred with the space shuttle Columbia in January of 1986, sobering and saddening as it was, should nevertheless be viewed as a beginning for developing a new generation of better and more versatile space launching devices and space vehicles.

- 2 -

H.R. 3112 and H.R. 4316 are proposed additions to the existing United States patent laws pertaining to inventions and their use in outer space. The proposed bills are quite different in their content and effect. H.R. 3112 relates to ownership of inventions made in outer space. H.R. 4316, relates to jurisdiction of inventions in outer space by the United States.

Turning first to H.R. 3112; this bill has the laudable purpose of vesting ownership in inventions made in outer space in the inventors. Nevertheless, we believe the bill to be premature. This bill focuses solely on the outer space locus of the inventive act for determining inventorship rights. But, more importantly, there are other, broader based, bills pending relating to Federal policies on inventors' rights, e.g., S. 64 and H.R. 3773, which should be addressed for consistency and good order before taking this bill up for consideration, as the resolution of these bills will undoubtedly influence the language of this bill. Therefore, for this, and other reasons, we do not support consideration for passage of H.R. 3112 at this time.

Turning to H.R. 4316: We support this bill. It closely parallels H.R. 2725, introduced by Mr. Kastenmeier in the 1st Session of the 99th Congress, differing therefrom by excepting from the bill any space vehicle or component specifically identified and otherwise provided for by an international agreement to which the United States is a party from the act. This bill is, we believe, an affirmation of the present patent laws as they extend to outer space. We believe, however, the words "made or used" should be changed to made, used or sold wherever they appear in the bill. Simply because the possibility of sales occurring in outer space may seem to be remote is no reason to exclude them from being acts of infringement because they occur in outer space; such sales have always constituted infringement under Title 35.

I hope this Statement proves useful to you and the others on the subcommittee and thank you for the opportunity to appear before you on these bills. I'll be pleased to answer any questions you may have concerning the Statement.


L. C. Krogh

LESTER C. KROGH, Ph.D.
BIOGRAPHY

Lester C. Krogh received a B.S., in chemical engineering, from the University of Nebraska in 1945, and an M.S. in organic chemistry (also from the University of Nebraska) in 1948. He completed work on a doctorate in organic chemistry at the University of Minnesota in 1952. Krogh joined the 3M Company's Central Research Laboratories as a Senior Chemist in 1952, and has been a 3M employee ever since. He has held 14 different positions at 3M, and moved into his present job as Vice President, Research and Development, in October of 1982. Krogh is affiliated with many business, professional and civic organizations, and has taken on many professional and public service assignments. Typical of these assignments are his work as a member of the Milwaukee School of Engineering's Board of Regents, and his service on the National Research Council's Space Applications Board.

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Mr. NELSON. Thank you.

There's a good example of things we just wouldn't ordinarily think of today, in fact, may be the norm in the future, whereby sales transactions are actually occurring in outer space. That's not unreasonable, particularly if you have a full-time presence in space in the way of a space station, ultimately, in the National Commission on Space's recommendations, you know, colonies on the Moon, manufacturing on the surface of the Moon, et cetera; it's not without the realm of reason that you could actually have sales transactions going on in space, particularly so when the cost of a pound to orbit comes dramatically down with the next generation of manned vehicles some time in the next century.

I'm curious, what were the crystals that 3M grew in space?

Dr. KROGH. Some of them are proprietary, Mr. Chairman, but the model compound was urea, and urea is a model compound for the study of nonlinear optics, which is a completely new branch of science which should be leading into such things as optical communications, and that's the reason for the interest in those kinds of materials.

Mr. NELSON. Sure.

Did you do any work in crystal growth with proteins?

Dr. KROGH. No, we have not done so. We are specifically in the area of organic crystals and polymeric crystalline materials, not proteins.

Mr. NELSON. Mr. Burnett.

**STATEMENT OF DENNIS J. BURNETT, ATTORNEY AT LAW,
BENNER, BURNETT & COLEMAN, WASHINGTON, DC**

Mr. BURNETT. Thank you, Mr. Chairman.

We have previously submitted a statement, and we'd like to have that included in the record, please.

I would also like to have the record reflect that we have submitted a copy to the subcommittee of our registration with the Attorney General as agents of a foreign—foreign agents under the Foreign Agents Registration Act, which is what we are required to do.

Mr. NELSON. Pull that microphone to you a little bit, please.

Mr. BURNETT. Thank you.

I'd like to summarize some of the main points that we made in our more lengthy statement, the points that I'd like to leave with the committee today. My comments will deal mainly with H.R. 4316, as H.R. 3112 deals primarily with inventions and relationships with NASA contractors.

I would like to commend the sponsors and the drafters of H.R. 4316. I believe that this law does indeed go a long way to clarify the present law with regard to patents in outer space. My comments here today are mainly technical, and they're designed to be in support of this bill and hopefully will improve it.

We have essentially one suggestion and two comments. The one suggestion is that the bill be amended to make an explicit reference to the Registration Convention, to state that inventions on a vehicle registered by the United States shall be considered to be made or used within the United States.

Our suggestions are that—well, we commend the agreement feature regarding the applicability of patents to components, and we also commend the feature of the bill which allows ventures to be covered by this provision which have been added by the Judiciary Committee.

Now with regard to our suggested amendment, the bill is not clear in all cases, in our opinion, and that is because of the use of the words "jurisdiction or control," particularly "or control," for there are some cases where, in fact, when you have a foreign participation you may not have the same result as you would have under the Registration Convention. The terms that are used here are not identical with the Registration Convention, and the terms are not precise in themselves.

We believe it would be far better to remove all ambiguity by making a direct reference. We believe this would be consistent with the intent of the bill, and it would say what is meant. Now we have more lengthy comments in our written statement, and I'd be happy to answer any questions about that.

Mr. NELSON. All right. Let's clarify here. Are you an attorney for an international client?

Mr. BURNETT. That's correct.

Mr. NELSON. MBB/ERNO is one of your clients?

Mr. BURNETT. Exactly.

Mr. NELSON. OK. Please proceed.

Mr. BURNETT. All right.

My two comments are, as I stated before—before I get to that, I might say that there is an alternative to the suggestion of amending the bill, and that is that the legislative history be made clear as to the effect of jurisdiction or control, and that would be—the committee could, if it so chooses, make a statement that jurisdiction and control is to be determined *prima facie* by the registration under the Registration Convention. This is an alternative suggestion. However, I think the direct amendment to the bill would be preferable as it's much clearer.

We believe that the agreement feature for components is a very good feature of the bill. It parallels the Registration Convention very nicely. We believe that this feature will facilitate international cooperative ventures between the United States and foreign countries. We also believe that the feature of the bill which covers private ventures is also a very good feature of the bill. We believe that this will be beneficial to U.S. facilities providers who may have foreign customers that wish to use those facilities.

For example, we have a client, a foreign client, that would like to use the facilities that are being proposed by Space Industries of Houston, TX, and they would like to put their own components in these U.S.—what would be U.S. facilities. However, the secrecy provisions of the U.S. patent laws give these, my foreign clients, a good deal of concern. Now we believe that this can be solved by this legislation, and therefore we think it's a very good feature of the bill.

This also works in reverse. We believe that it would benefit U.S. users of foreign facilities by allowing the United States to enter into agreements with foreign governments so that U.S. patent law could be applied. Companies such as 3M, therefore, could use the fa-

cilities that may be available from foreign countries that may not be available from U.S. sources and still get the benefits of the time when the clock starts running for an invention.

We urge that the legislative history be made clear in this regard. We think that would be very helpful although not absolutely necessary.

Mr. Chairman, it's been a pleasure to appear and discuss these issues before you. We support legislation both here and abroad that will help clarify and add certainty to the application of patent law to activities in outer space, and we believe that this bill, H.R. 4316, does that, and we hope that our comments might help you reduce the potential for future litigation or conflict between national laws when we have activities in space which involve more than one nation.

Thank you very much.

[The prepared statement of Mr. Burnett follows:]

Before the
Subcommittee on Space Science and Applications
Committee on Science and Technology
United States House of Representatives
12 August 1986

HEARINGS ON: H.R. 4316 AND H.R. 3112

Statement of
Dennis J. Burnett
Attorney for
Messerschmitt-Bölkow-Blohm, GmbH
(Munich)

Statement of Dennis J. Burnett
 Attorney for
 Messerschmitt-Bölkow-Blohm, GmbH

Mr. Chairman and Members of the Subcommittee: Thank you for this opportunity to participate in these hearings to consider the applicability of U.S. patent laws to activities in outer space.

Interest of MBB/ERNO

Messerschmitt-Bölkow-Blohm, GmbH ("MBB") and its subsidiary ERNO Raumfahrttechnik, GmbH ("ERNO") are corporations existing under the laws of and headquartered in the Federal Republic of Germany. MBB/ERNO manufactures commercial and scientific spacecraft, spacecraft systems, subsystems and components. MBB/ERNO has been involved in a variety of cooperative space programs between the National Aeronautics and Space Administration ("NASA") and the European Space Agency ("ESA") and between NASA and the German Federal Ministry of Research and Technology ("BMFT").¹ Some of the major international programs with NASA in which MBB/ERNO has been involved as a contractor of ESA or BMFT have been HELIOS, the Gamma Ray Observatory, Solar Max, Galileo, Space Lab and Space Station. In addition, MBB/ERNO has been involved in a number of commercial space transactions

¹ "BMFT" is the German language abbreviation for the "Bundesministeriums für Forschung und Technologie," a cabinet level ministry of the Government of the Federal Republic of Germany.

with U.S. companies, including portions of the INTELSAT V and INTELSAT VI contracts.

NED/ERNO fully supports the concept of international cooperative arrangements, both governmental and commercial, to undertake scientific, developmental and commercial space activities. Such international arrangements maintain and strengthen the scientific, economic and cultural ties between the United States and the Federal Republic. As a potential contractor, NED/ERNO greatly appreciates this opportunity to put forward its views of how the proposed legislation would affect both the participation of foreign contractors in international cooperative agreements and private sector initiatives with U.S. business. These comments will be directed primarily to H.R. 4316 (as H.R. 3112 appears to deal primarily with the relationship between U.S. federal agencies and their inventor contractors).

Need for Clarity and Certainty

It is our understanding that the purpose of the proposed legislation is to define precisely the application of U.S. patent law to activities in outer space because the applicability of the U.S. patent law is currently unclear and uncertain. Clarity and certainty of the applicable law and jurisdiction are necessary for space activities, especially when large investments in planning and capital by nationals of more than one nation or cooperative ventures between nations are involved. The proposed

legislation is precise in cases involving only United States interests. However, the legislation is not clear and certain in all cases involving U.S. and foreign interests because of the use of the phrase "jurisdiction or control" in lines 5 and 19 of page 2 of H.R. 4316. The use of this terminology may create situations where more than one nation may assert the application of its patent law to the same space activity in a manner inconsistent with the provisions of international agreements governing national responsibility for space activities; i.e., the Registration Convention² and the Outer Space Treaty.³

Registration Convention and Outer Space Treaty

Article II of the Registration Convention provides:

1. When a space object is launched into orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain. . . .
2. Where there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the object in accordance with paragraph 1 of this article bearing in mind the provisions of article VIII of . . . [the Outer Space Treaty] and without prejudice to appropriate agreements concluded or to be concluded among the launching States on jurisdiction and control over the space object and over any personnel thereof.

² Convention on Registration of Objects Launched into Outer Space, opened for signature January 14, 1975, 18 UST 2410, TIAS 8480 (entered force September 15, 1976).

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, opened for signature January 27, 1967, TIAS 6347, 610 UNTS 205 (entered into force October 10, 1967).

A "launching State" is defined as a State (1) which launches a space object, (2) which procures the launching of a space object, or (3) from whose territory or facility a space object is launched.

Article VII of the Outer Space Treaty provides:

A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body

Taken together, the Registration Convention and the Outer Space Treaty provide a clear and precise method of determining "jurisdiction and control" over activities in space and reduce the potential for conflict between nations. If there is one launching State, it registers the spacecraft and has jurisdiction and control. If there is more than one launching State, the States agree which shall be the State of registry and, unless the States specify otherwise, the State of registry has jurisdiction and control. The States may, however, agree that (1) different components may be registered by different launching States, or (2) that a launching State other than the State of registry may have jurisdiction and control.

Need for a Clarifying Amendment

The proposed legislation has been drafted in an attempt to be consistent with the Registration Convention and the Outer Space Treaty. However, we believe that the bill falls short in

one important respect that if not corrected may result in future litigation or conflict between governments or commercial entities. Specifically we are concerned that a U.S. court may find U.S. "control" in a case where a spacecraft is registered by a foreign nation. The present formulation of the legislation may lead U.S. courts to conclude that "jurisdiction" and "control" are separate concepts. This concern arises for the following reasons:

1. The phrase "jurisdiction or control" used in the proposed legislation is not the same as "jurisdiction and control" used in the Registration Convention and the Outer Space Treaty. A U.S. court may question why Congress used different words and may conclude that a different result was intended.
2. The words "jurisdiction" and "control" do not necessarily have the same meaning in the proposed legislation as they do in the Registration Convention and the Outer Space Treaty.
3. Factual control may exist in cases where "control" as meant in the Registration Convention and Outer Space Treaty would not exist. For example, if communications to a foreign space craft are routed through U.S. territory or if command and control services are provided by U.S. corporations, a court could well find U.S. "control" even though there was foreign jurisdiction. Likewise, "control" may be found to

exist where there are elements of U.S. ownership or management even though the spacecraft had foreign registration.

Given the amounts invested in any given space activity, these risks are very large in terms of potential financial exposure. This would, of course, inhibit U.S. financial and management participation in foreign space ventures. Furthermore, because other countries are likely to follow the lead of the United States in this area, risk is likely to be created for U.S. companies under foreign patent laws. In our opinion, it would be best to make the legislation as clear as possible and eliminate all unintended risks.

We therefore suggest a clarifying amendment consistent with the intent of the legislation which would remove the potential for conflict. We suggest that the phrase "under the jurisdiction or control of the United States" in lines 5 and 19 of page 2 of H.R. 4316 be replaced by the phrase "registered on the registry of the United States (as provided by the Convention on Registration of Objects Launched into Outer Space (TIAS 8480))". Section 1(a)(1) and section 1(b) of H.R. 4316 thus would read as follows:⁴

⁴ Material to be deleted is bracketed and scored through. Material to be added is underlined.

(1) Chapter 10 of title 35, United States Code, is amended by adding at the end the following:

"§ 105. Inventions in outer space

Any invention made or used in outer space on an aeronautical and space vehicle (as defined in section 103(2) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2452(2)) [~~under the jurisdiction or control of the United States~~] registered on the registry of the United States (as provided by the Convention on Registration of Objects Launched into Outer Space (TIAS 8480)) shall be considered to be made or used within the United States for purposes of this Title, except with respect to any space vehicle or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party."

* * * * *

(b) AMENDMENT TO NATIONAL AERONAUTICS AND SPACE ACT.--Section 305 of the national Aeronautics and Space Act of 1958 (42 U.S.C. 2457) is amended by adding at the end the following new subsection:

"(m) Any invention made or used in outer space on an aeronautical and space vehicle (as defined in section 103(2) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2452(2)) [~~under the jurisdiction or control of the United States~~] registered on the

registry of the United States (as provided by the Convention on Registration of Objects Launched into Outer Space (TIAS 8480)) shall be considered to be made or used within the United States for purposes of this Title, except with respect to any space vehicle or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party.".

A less desirable alternative to amending H.R. 4316 as we have proposed, is to explain the meaning of "jurisdiction or control" in the legislative history of H.R. 4316. We suggest that the legislative history state that the term "jurisdiction or control" is intended to be consistent with the provisions of the Registration Convention and the Outer Space Treaty and that the country of registration of a space object is prima facie determinative of both jurisdiction and control for the purposes of this provision.

Other Comments

First, the amendment to H.R. 2725 added by the Subcommittee on Courts is entirely consistent with the Registration Convention. That amendment closely reflects Article II, paragraph 2 of the Registration Convention. This provision clearly allows the U.S. government to agree to apply foreign patent law to

specified space vehicles or components regardless of the State of registry.

Second, we also urge the Committee to make clear in the legislative history that this provision applies not only to international cooperative agreements by NASA but to any international venture in space (including private ventures). The proposed legislation allows foreign customers to contract to use private U.S. space vehicles and facilities without being subjected to conflicting patent law regimes if there is an appropriate covering agreement with the United States. This feature of the legislation is important to potential foreign users of U.S. facilities (as well as potential private U.S. space facilities providers) and is important to potential users of foreign facilities.

As an example, foreign users of a private or government U.S. space station would not want to have inventions made in their payloads be subject to the secrecy provisions of the U.S. patent law.⁵ The U.S. facilities provider and the foreign customer would both benefit if an agreement can be reached between the U.S. government and the foreign government that provides that inventions made or used on a specified component would be subject to the patent law of the foreign government.

⁵ 35 U.S.C. §§ 181-188.

Conclusion

Mr. Chairman, members of the subcommittee, it has been a pleasure to come before you to discuss this important legislation. It is highly desirable that there be clarity and certainty as to the applicability of the patent laws of all nations to activities on space vehicles. This is particularly true for international cooperative arrangements and for international commercial ventures.

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BIOGRAPHY

DENNIS J. BURNETT, born Lexington, Nebraska, February 14, 1947; admitted to bar, 1973, Nebraska; 1978, District of Columbia. Education: Nebraska Wesleyan University (B.S., 1970); University of Nebraska (J.D., 1973); Georgetown University (LL.M., 1976). Member, Nebraska Law Review, 1971-1973. Author: "NASA Commercial Space Policy," The Air and Space Lawyer, Spring, 1985; "Remote Sensing Satellite Data Policy," Proceedings of the Forum Committee on Aviation and Space Law, American Bar Association, February, 1984; "Industry in Space: A Plan for Increased Participation," 5 Comsat Magazine 31, 1981; "Shipping Retaliations Under United States and International Law," 1 N.C.J. Int. L. & Comm. Reg. 56, 1976. Counsel, Communications Satellite Corporation, 1982-1984. General Attorney, Comsat General Corporation, 1978-1982. Attorney, Federal Maritime Commission, 1974-1978. Member: The District of Columbia Bar; Nebraska State Bar Association; Maritime Administrative Bar Association. Language: German.

Mr. NELSON. OK. To summarize then, each of your comments are supportive of the thrust of the legislation, H.R. 4316, which is that any invention made in space shall be considered to be made or used within the United States if it was made on a space vehicle of the United States with the one exception that with regard to a space vehicle or component thereof that is identified or provided by an international agreement, that it then is open to question as to whose patent law operates under that particular arrangement. Is that the concept that basically all of you embrace?

Dr. KROGH. Yes.

Mr. NELSON. OK. Now, Mr. Burnett, your suggested amendment that you change the wording, "under the jurisdiction or control of the United States," that is, any invention made or used in space on a U.S. space vehicle.

Mr. BURNETT. Yes.

Mr. NELSON. Under jurisdiction or control of the United States—you want to change that to registered on the registry of the United States.

Mr. BURNETT. That's correct.

Mr. NELSON. All right. What do the rest of you guys think about that?

Mr. KEMPF. If I may, sir.

Mr. NELSON. Mr. Kempf.

Mr. KEMPF. I prefer the alternate approach mentioned, in that registry on the register probably should be taken as prima facie evidence of jurisdiction and control, and I believe our former testimony said that, but I think registry, per se, in the legislation is a bit too restrictive. As a matter of fact, early on I discussed this with Neil Hosenball, former NASA general counsel, and some of our international affairs people, and they preferred jurisdiction and control rather than registry in the legislation itself. Then the legislative history could be clear that registration is prima facie. That is the way you would do it in the majority of the situations, but there may be others.

Mr. NELSON. All right.

Mr. Burnett, you said you would accept that.

Mr. BURNETT. Yes.

Mr. NELSON. You said, or have a legislative history that is sufficient to state right there that the space object is prima facie evidence—

Mr. BURNETT. That's correct.

Mr. NELSON [continuing]. Of the jurisdiction and the control.

Mr. BURNETT. Yes, sir, that is correct.

We would, of course, prefer that it be right there in the statute itself because a judge doesn't necessarily look to the legislative history, but if that is not acceptable, then the second best alternative is the approach we're talking about here.

Mr. NELSON. Do you all know of anybody in any quarters who opposes this legislation?

Dr. KROGH. No.

Mr. NELSON. Has the staff heard of anybody who opposes it?

OK.

Mr. Walker.

Mr. WALKER. Thank you, Mr. Chairman.

I, too, would like to say, Dr. Krogh, we appreciate your vision in putting the language "sold" in there too. I think that that really does begin to speak to some of what the business community is thinking about over the long term in space. We need to be aware that as we design things where we're in uncharted waters, we need to be very careful that we are not limiting; what we're attempting to do is expand. I think your suggestion is a very good one, and I think we'll probably get the committee to put that language into the bill because it makes a lot of sense.

I'm trying to anticipate a little bit the kinds of problems that accrue, and maybe you can help me get some general knowledge here.

If, under this legislation, you had a European spacelab aboard an American space shuttle, making priority products for a European industry, where would the patent rights be? Where are they now, and where would they be under this bill?

Mr. KEMPF. Under the bill, it is my assessment that there would be no problem as far as ownership, as set forth in any agreement, and also that agreement could probably be set forth—the jurisdiction. The exception written into the bill, I think, allows you this flexibility by negotiation. If you specifically identify that laboratory as a component to be carried on the other space vehicle, you could, by agreement, reach accommodation on those points, and that is why we believe that flexibility is useful.

Under the present law, one can look at the Outer Space Treaty and one can look at the Registration Convention and possibly—and I underline the word "possibly"—reach that same interpretation, but this is one of those uncertainty issues that we would like to put to rest.

Mr. WALKER. And so it is precisely that kind of situation that this legislation would clarify.

Mr. KEMPF. I believe it would.

Mr. WALKER. OK. Now, another hypothetical. What if you were carrying materials to space aboard a European space vehicle—say, a Hermes—at some point that was going to an American space station. The manufacturing was taking place aboard an American space station and being brought back to Earth, again, by a European vehicle. Under the bill, where would we be in those kinds of situations?

Is the very fact that it's being manufactured aboard an American space station then—is that where the patent right would exist?

Mr. KEMPF. If the place where it's being manufactured is under the jurisdiction or control of the United States, then U.S. law would apply for the patent rights there.

Again, on the ownership issue, by agreement of the parties, one could decide who owns the inventions, but as far as enforcing title 35 of the United States Code for infringement or determining priority of inventions and related matters, then the U.S. laws rather than the foreign laws would apply, unless the international agreement specifically identified a component to do otherwise.

Mr. WALKER. All right. Now the question that then comes to my mind is, when we talk about jurisdiction and control by the United States, is that governmental, or does it also affect privately owned facilities that are owned by American citizens?

For example, you fly something like the Faget station. You have Europeans maybe involved on it. You have Americans and so on. Now, is a space station that is flown by an American regarded as being a space station that is under the control and jurisdiction of the United States?

Mr. KEMPF. I'll venture an answer.

Mr. WALKER. OK.

Mr. KEMPF. And this gets to the registration issue that was just discussed. I do believe if it is registered, and walking through, again, the Outer Space Treaty and the Registration Convention, if properly carried under U.S. registry, I don't think it has to be U.S. Government owned any more than, say, a ship on the high seas owned by a private freight company, as long as it's registered under the Registration Convention.

Taking this one step further and talking on the control issue, I guess I would have to defer that. Physical control by the U.S. Government would clearly put it under U.S. jurisdiction, and that physical control by some court cases means electronic command and control from a ground terminal. Whether or not the same would apply for control only, for the private sector, I can't answer that, but one would hope that if it's registered that would be *prima facie* and resolve the question.

Mr. BURNETT. This, I think, points out why we've suggested changing the language in that it wouldn't be a close question if we changed the language, it would be absolutely certain. If it were registered on the U.S. registry, then, by definition, patent law would apply to it, and that would be the end of the question; we wouldn't need to go any further.

Mr. KIRK. If I might, Mr. Walker, one of the concerns that we would have with the suggestion to change the wording to "registry" only, as opposed to the alternative of a *prima facie* evidence and legislative history, is the possible impact this has on nonspace applications and whether or not U.S. law applies or does not apply.

There's a lot of case law that's been developed that does not necessarily affect space. So if we were to limit this to registry, query, are we undoing law in other areas? At this point, I'm not prepared to try to answer that, but I think that's something that would need to be considered carefully if we limited ourselves strictly to registration.

Mr. WALKER. Well, I really do think we are wading into a most interesting area here with an awful lot of broad term implications. I mean, if we take Dr. Krogh's point about the selling taking place, and if you begin to envision people selling between a Soviet space station and an American space station, or something like this, and where does law begin to apply there, particularly if you have people developing new products there that are essentially for space use only and have no real applicability on Earth, but then are sold internationally, you begin to have some very interesting, it seems to me, new case law that is going to arise out of that, and I just hope that we use enough foresight in the language that we come up with that we don't end up handcuffing the process rather than expediting it.

I thank you. Thank you, Mr. Chairman.

Mr. NELSON. Mr. Torricelli, or, if you're from Monticello, Mr. Torricelli.

Mr. TORRICELLI. Thank you, Mr. Chairman, or Mr. Chairman, wherever you're from.

Wouldn't it be clear to you in interpreting the bill that is written, or should it be added at what point a state has abandoned or lost jurisdiction or control over a space station or platform? It appears to me we're dealing with a level of technology where the life of a station in human terms is almost infinite. Should it better be defined when or how operational control or jurisdiction is lost, or assumed to be, when placed permanently?

Mr. BURNETT. I don't think it would be necessary because the Outer Space Treaty and the Registration Treaty impose an obligation upon the state to maintain control and jurisdiction over its own activities and all activities of its nationals in outer space.

Mr. TORRICELLI. Even beyond its useful or functional life.

Mr. BURNETT. That's right. It just says "in outer space," period. There's no limitation on it; so I don't think there's any requirement for it, but that's an off-the-top-of-my-head answer.

Mr. KIRK. I would agree with Mr. Burnett, Mr. Torricelli. I think that also there's the practical factor that once it has exceeded its useful life and, for example, drifted off into space, I think at that point you're no longer concerned about the practical effects of whether or not something is being infringed in space.

Mr. TORRICELLI. What I was envisioning is circumstances where a station is used for a number of years—as the Soviets recently have—encounters difficulties—as the Soviets did with their last station—would appear to have been abandoned and then a crew was sent up, reactivated it, and it's used again. So it goes through various phases of its life.

My concern was whether then, in interpreting the law in the future, someone would argue this was a registered station; as a ship lost at sea, it was abandoned and now was reactivated. But what I wanted the record to reflect is our interpretation and your belief that, even despite such an interim abandonment or technical problems it may have experienced for a while—the departure of its crew, the loss of its functions, the end of communications—it can be reactivated in the future and remains part of the same life cycle, despite the realities of its technology—technological operation, which is obviously your interpretation of it.

Are any of you aware whether anyone to date has attempted to seek a patent for any invention material that was developed or partially developed in space? Does this have any practical implications to date?

Mr. KEMPF. There have been cases where an invention was conceptually created on Earth but first put to practice or reduced to practice on the patent law, when that event vested rights, and there have been cases where activities in geo-stationary orbit were the acts that were relied on to establish reduction of practice and thereby the ownership of those inventions.

As far as—

Mr. TORRICELLI. Could you describe those?

Mr. KEMPF. The one that immediately comes to mind is the attitude control system for a number of spin-stabilized communications

satellites today. The original invention was tested somewhat in the laboratory as a very crude working model. A patent application was filed; it was subsequently incorporated on the early Syncom satellites and operated successfully in geostationary orbit.

The issue was whether or not the initial testing in the laboratory or the first successful operation in geostationary orbit was a reduction of practice. The decision on that point determined the ownership of the invention, and there was litigation on the point. Testimony was taken on the basis of laboratory testing and testimony taken on what was actually built, constructed, and operated in geostationary orbit, and the courts have held—and there have been some other similar type activities involved in litigation, and courts have held both ways on the merits of these cases, depending on the degree of testing, but in every case the courts have accepted and assumed jurisdiction and taken evidence based on activities in geostationary orbit.

Mr. TORRICELLI. Mr. Chairman, you may be in a better position to address this, and forgive me if it was raised before I entered, but is the question yet on the space station the relationship of ownership to the components of the station to the overall American frame of it yet clear or to be negotiated whether or not a European component of it represents ownership or rental of space? Is that considered to be an open issue? Do any of you know that?

Mr. BURNETT. Well, no, I'm not privy to those discussions, so I don't know exactly what's an open issue and what's not, so I can't answer.

Mr. TORRICELLI. Mr. Chairman, did you hear my question?

Mr. NELSON. I didn't.

Mr. TORRICELLI. I'm inquiring whether, as we are now dealing with the European Space Agency, the European components of it will be considered to be of European ownership or rental of part of an American frame. I have never heard that question addressed. Are you aware of that?

Mr. NELSON. To my knowledge, that is a matter of negotiation.

Mr. TORRICELLI. It is to be negotiated?

Mr. NELSON. Yes.

Is that correct, Mr. Kempf?

Mr. KEMPF. That's an open issue in preliminary discussions, and it's probably best not to comment on it.

Mr. TORRICELLI. Mr. Burnett, I notice the German corporations have had components on Soviet space probes, I think most recently on Halley's there were German components of it. I do not know whether they were from the Messerschmitt company. If they were, can you tell me if there were some arrangements with regard to data of a patent copyright nature that might have come back?

Mr. BURNETT. No, I do not know anything about those arrangements, or if there were any arrangements, or if Messerschmitt was involved in them, I'm sorry.

Mr. TORRICELLI. Thank you.

Thank you, Mr. Chairman.

Mr. NELSON. OK. Mr. Lujan.

Mr. LUJAN. Thank you very much, Mr. Chairman, and I'm sorry I was late; I was on the floor, because we had the computer securi-

ty bill over there and didn't have an opportunity to get back as quick as I could.

But I've been interested in the discussion and have read the testimony, particularly as it refers to H.R. 3112, which is a bill that I introduced, and there are some legitimate concerns which I have been worried about also in that bill. For example, do Government employees get those rights if they're, you know, in the course of their work? Using the most famous of all astronauts, I guess Sally Ride, if she discovers something while she's doing her work, does that belong to her? Or companies doing it under contract, whether they get it, and then you have the subquestion of, is it the company or the employee?

However, there is one thing that, you know, perhaps encourages—and that's what this whole bill is about, the encouragement of commercialization of space—that they may be doing something under contract but find some side use or some side invention that has nothing to do with the basic focus of their contract, or a grant, for example.

I was interested in looking at, you know, the first commercial product, as they call it, the standard reference material. It was work by LeHigh University and NASA. Who has the rights to it?

Mr. KEMPF. LeHigh University has principal commercial rights. There were several inventions related to this activity. Some were done under grant, and we waived rights to LeHigh under the grant. Some were done in conjunction with LeHigh employees by some of our Civil Service employees at the Marshall Space Flight Center, and I can recall, we negotiated and executed license rights back to LeHigh, so that they have basically the commercial rights to this.

Mr. LUJAN. But that remained—that required the magnanimous effort on the part of NASA to release those rights to LeHigh University—is that correct?—so that somebody that did invent something in space just has to depend on whether NASA would be kind enough to let them have the rights rather than just automatically give them the rights, as these bills purport to do.

Mr. KEMPF. Well, as far as the contractor-grantee is concerned, we have adopted the Presidential memorandum on Government patent policy, and the presumption is that the contractor-grantee should have rights. We would have to justify, programatically, why it would not be in their interests, from a programmatic reason, to not let the contractor have rights. As a practical matter, since we perceive commercialization as an objective of our programs, it's a very rare case indeed in which we will not allow the contractor to have rights.

Mr. LUJAN. When you say, "The grantee should have rights," does that differ from, "The contractor does have rights"?

What we are trying to establish in the legislation is that the contractor does have rights, and you said "should have rights." We're very sensitive about the use of the word "should" or "may" or "does" in our committee deliberations, as you know.

Mr. KEMPF. Theoretically, there is a distinction between the two. One is a vesting by operational law, and one is a process where a decision has to be made.

Program managers, nonpatent lawyer types, who occasionally, depending on the nature of the program, may have some questions as to these rights; it may be in a 0.00 percent of the circumstances, but it is—they may be justified programmatically.

We tend to be somewhat reluctant to take the ultimate decision, even though it's a rare case, out of the hands of program managers.

Mr. LUJAN. Would you characterize this legislation as—from the point of view of the inventor, that it's more advantageous to that inventor than the present policy or less?

Mr. KEMPF. To the inventor as the individual——

Mr. LUJAN. Who receives the rights.

Mr. KEMPF. Yes. Rather than his corporate employer.

Mr. LUJAN. No, no. Rather than depending on NASA to make the decision.

Mr. KEMPF. Yes. For the inventor as an individual, yes; I would say yes.

Mr. LUJAN. Now this registry question that you were discussing with Mr. Walker where you said, "Well, you know, if the space station was registered in the name of the United States," such as a boat or an airplane or something like that, I assume is what you meant, but we do not now require that for a space station, do we?

Was spacelab listed in the registry as a U.S. vehicle?

Mr. KEMPF. I'm sorry, sir, I cannot answer specifically, although it's my understanding that the Outer Space Treaty and the Registration Convention does require registration of any nation launching something into space. So I assume that the registration process has gone through, but I can't answer that with certainty.

Mr. LUJAN. Does anybody know if spacelab was entered in the registry as coming from the United States? Now we certainly do for the shuttle; I assume that there would be no question about that. Do we have to do that with rockets as well?

Mr. BURNETT. Yes.

Mr. KEMPF. I believe so. The treaty is written to apply to any object launched into outer space. There may be a question as to where outer space begins, but assuming it goes into outer space, I think any object of any nature would probably have to be registered.

Mr. BURNETT. Yes, the definition includes the launch vehicle.

Mr. LUJAN. Pardon me?

Mr. BURNETT. I said the definition in the treaty includes the launch vehicle.

Mr. LUJAN. OK.

Mr. NELSON. Will the gentleman yield?

Mr. LUJAN. Certainly.

Mr. NELSON. Article 2: "When a space object is launched into orbit or beyond, the launching state shall register the space object by means of an entry in the appropriate registry which it shall maintain."

Mr. LUJAN. I'll pass for now. Thank you, Mr. Chairman.

Mr. NELSON. Mr. Slaughter.

Mr. SLAUGHTER. No questions, Mr. Chairman.

Mr. NELSON. Let me ask you about the present space station negotiations with international partners. What effect would H.R. 4316 have on the U.S. position in those negotiations?

Mr. KEMPF. I believe that H.R. 4316 could have a positive effect by virtue of the clarity and certainty it provides, plus the flexibility, which may be there anyway, but it's clear and certain the way it is written.

Mr. NELSON. Anybody else?

Dr. KROGH. I would agree with that. I think it makes it certain, which is what industry wants to know.

Mr. NELSON. OK. Now do NASA and the State Department, representing the United States, do they have sufficient flexibility under H.R. 4316?

Mr. KEMPF. It is my perception that they do. I really can't speak for State.

Mr. NELSON. How about under existing law? Do they have the sufficient flexibility?

Mr. KEMPF. That is subject to the uncertainty issue that we've talked about. As a personal opinion only, I believe that we do, but not everyone agrees with me on this point.

Mr. NELSON. Mr. Kirk.

Mr. KIRK. I would agree with Mr. Kempf. As I indicated before, my interpretation is also that we have that flexibility today under existing laws and treaties and past precedents. I think the issue that Dr. Krogh raises of certainty for industry, that's the important aspect; that's what H.R. 4316 would give us.

Mr. NELSON. Do either of these bills before the committee today affect existing U.S. treaty obligations?

Mr. KEMPF. I believe not, sir. H.R. 4316, following our theory that it only clarifies existing law, should have no effect. I don't think H.R. 3112 would in that I'm assuming it will be prospective in nature, and any vested rights that exist now will not be affected by it.

Mr. NELSON. OK. Let the record show that Mr. Kirk agrees with that statement of Mr. Kempf.

All right. Now how about—it's our intention of these bills that they would apply prospectively into the future. Do any of you all see anything different?

Mr. KIRK. I would offer only one comment on that, Mr. Chairman, and that's with respect to H.R. 4316. Great care has been taken in H.R. 4316 to ensure that it be prospective only and that it not apply retroactively, particularly to pending litigation, which I think is the right approach.

It did occur to us as we were reviewing the legislation that it might be even stated a little more clearly than it is. In that regard, I would refer to section 2(c) where it states that, "The amendments made by section 1 shall not affect the right of any party in any case pending in a court on date of enactment to have the party's rights determined on the basis of the law in effect," et cetera.

What this statement leaves open, I think, is that it leaves undressed and perhaps prejudices the right of a party who has a cause of action—

Mr. NELSON. A cause of action on that particular day.

Mr. KIRK [continuing]. Which had arisen prior. There's no case pending, but the cause of action is in existence.

Mr. NELSON. Yes.

Mr. KIRK. So I think that there could be some clarification added in that respect.

Mr. NELSON. OK. Do any of you have any problems with that?

Mr. KEMPF. I agree with Mr. Kirk.

Mr. NELSON. OK. All right. Do any of you see in any way that H.R. 4316 impinges on the rights that currently exist under U.S. patent law? Maybe the better word instead of "impinge" is "restrict" rights which currently exist under U.S. patent law.

Mr. KEMPF. I do not.

Mr. KIRK. I don't think that I see it impinging on rights that currently exist, with the possible caveat that if one were to disagree with my interpretation that this is the same as existing law, they might say that this changes existing law, and therefore they would argue that, yes, it does impinge somewhat, particularly an accused infringer. But that would not be my view.

Mr. NELSON. OK. And Dr. Krogh nods no as well.

Dr. KROGH. That's correct.

Mr. NELSON. All right. Mr. Kempf, what about NASA's activities to commercial—to encourage commercial development of space, the joint endeavor agreements? Does this bill in any way affect those JEA's?

Mr. KEMPF. H.R. 4316. Per se, it does not affect these JEA's, but by encouraging investment it has more effect on people willing to invest in these activities. But it would not affect the terms and conditions of a JEA.

Mr. NELSON. OK. Any members of the committee have any further—Mr. Lujan?

Mr. LUJAN. Mr. Chairman, I don't have any questions, but I did have a statement.

Mr. NELSON. And it is submitted, without objection.

[The prepared opening statement of Mr. Lujan follows:]

OPENING STATEMENT
HON. MANUEL LUJAN, JR.
HEARING ON HR 4316 AND HR 3112
AUGUST 12, 1986

THE TWO BILLS THAT ARE THE SUBJECT OF TODAY'S HEARING ARE POTENTIALLY THE MOST SIGNIFICANT AND FAR REACHING LEGISLATION THAT THIS COMMITTEE WILL CONSIDER DURING THIS CONGRESS. TAKEN TOGETHER, HR 4316, WHICH ADDRESSES PATENT LAW IN OUTER SPACE, AND HR 3112, THE "OUTER SPACE INVENTION ACT", A BILL WHICH I INTRODUCED LAST JULY, CAN CREATE A CLIMATE IN WHICH SPACE COMMERCIALIZATION CAN REALIZE ITS FULL POTENTIAL.

WE LIKE TO TOUT OUR FREE ENTERPRISE SYSTEM AND BOAST THAT THE PROFIT MOTIVE HAS GIVEN AMERICANS THE HIGHEST STANDARD OF LIVING IN THE WORLD. UNFORTUNATELY, MR. CHAIRMAN, IN HIGH COST, HIGH RISK ADVENTURES MANY FOREIGN GOVERNMENTS OFTEN DO MORE TO AID AND ENCOURAGE INNOVATION THAN WE HAVE BEEN WILLING TO DO. AS A RESULT WE ARE FINDING WITH INCREASING FREQUENCY THAT FOREIGN COMPANIES ARE BEATING US TO THE MARKET PLACE WITH OUR OWN TECHNOLOGY.

THE ECONOMIC POTENTIAL FOR COMMERCIALIZATION OF SPACE IS SIMPLY TOO GREAT TO ALLOW THIS TO HAPPEN. THERE ARE ENORMOUS OPPORTUNITIES FOR EXPLOITING THE UNIQUE CHARACTERISTICS OF SPACE SUCH AS MICRO-GRAVITY, BUT IN MANY WAYS SPACE CONTINUES TO BE A HOSTILE AND VERY COSTLY ENVIRONMENT. BECAUSE OF THIS ENORMOUS COST AND HIGH RISK, WE NEED TO ACTIVELY ENCOURAGE PRIVATE SECTOR PARTICIPATION IN SPACE R&D.

ONE WAY IS TO PROVIDE THE ENTREPRENEUR WITH SOME ASSURANCE THAT HIS DISCOVERY CAN BE EXPLOITED SUFFICIENTLY TO MAKE A REASONABLE RETURN ON HIS INVESTMENT BEFORE OTHERS ARE PERMITTED TO COMPETE. FEW COMPANIES OR INDIVIDUALS ARE WILLING TO RISK THEIR ENTIRE ASSETS FOR A NEW IDEA ---- ESPECIALLY IF THE ABILITY TO MARKET THAT IDEA IS UNCERTAIN.

BUT IT ISN'T ENOUGH TO SIMPLY SAY THAT THE REWARDS OF A SUCCESSFUL COMMERCIAL VENTURE BELONG TO THE INVESTOR. A FUNDAMENTAL LAW IN RESEARCH IS THAT THE OUTCOME IS UNCERTAIN, AND OFTEN CANNOT BE PREDICTED. OFTEN THE END PRODUCT OF AN R&D EFFORT ISN'T EVEN IMAGINED AT THE OUTSET. NECESSITY MAY BE THE MOTHER OF INVENTION, BUT SERENDIPITY IS AT LEAST A CLOSE COUSIN, AND OPPORTUNITIES FOR SERENDIPITOUS DISCOVERIES ARE SIGNIFICANTLY ENHANCED WHEN THE EXPERIMENTER IS ENCOURAGED TO WIDEN HIS PERSPECTIVE.

THIS IS ONE OF THE AIMS OF MY BILL. IT WILL PERMIT THE INVENTOR TO REALIZE THE REWARDS OF HIS INNOVATION EVEN IF HE RECEIVES FINANCIAL ASSISTANCE FROM THE GOVERNMENT, AND EVEN IF THE DISCOVERY IS MADE IN THE COURSE OF WORK PERFORMED WHILE UNDER CONTRACT WITH THE GOVERNMENT. I BELIEVE THIS WILL ENCOURAGE THE INNOVATION AND ENTREPRENEURSHIP NEEDED TO KEEP THIS COUNTRY FIRST IN SPACE.

THIS BILL MAY NOT BE THE ONLY WAY TO ACCOMPLISH THIS OBJECTIVE ---- IT MAY NOT EVEN BE THE BEST WAY. AND IF THERE ARE HONEST DIFFERENCES IN OPINION AS TO HOW WE PROCEED TO ACHIEVE OUR GOALS, LET US WORK TOGETHER TO RESOLVE THOSE DIFFERENCES. THE REWARDS FOR SUCCESS ARE TOO GREAT TO RISK LOSING BECAUSE OF DISAGREEMENTS OVER THE APPROACH.

THANK YOU MR. CHAIRMAN FOR ALLOWING ME TO MAKE THESE REMARKS, AND NOW I WOULD LIKE TO JOIN YOU IN WELCOMING OUR WITNESSES. I AM ANXIOUS TO HEAR THEIR VIEWS ON THIS VERY IMPORTANT LEGISLATION THAT WE WILL BE ADDRESSING TODAY. ---

Mr. NELSON. Any further questions from the members? How about from the staff?

All right. I might point out for all of you present that Mr. Walker and I will have a press statement tomorrow announcing our intention of a markup of the NASA authorization bill which will occur on Thursday morning. We will be available to the press to state what the specifics are with regard to what we are going to offer to the committee in the remark, but I can just tell you, it is going to be an authorization for a replacement orbiter, it's going to be an authorization for the acquisition of launch services of ELV's so we can work off the backlog, and it will also be a policy statement in which there will not be precluded the shuttle to be used as a backup to expendable rockets for the launching of commercial satellites.

So that's basically the thrust, then with some underscoring on the National Council—Advisory Council on Space. So that's the thrust of where we're going. But Mr. Walker and I will be available for clarification on that proposed for the markup coming on Thursday morning, or shall we say the markup, because we're bringing the NASA authorization bill that we've already passed out of this subcommittee—we're bringing it back into the bosom of the subcommittee, and we'll massage it and change it and then send it on to the full committee.

Any further comments by anybody?

All right. We will adjourn the hearing, and we will reconvene tomorrow at 1 p.m., for our continuation of our hearings on assured access to space. Thank you, and have a good afternoon.

[Whereupon, at 2:15 p.m., the subcommittee was adjourned, to reconvene the following day at 1 p.m.]

APPENDIX #1

HUGHES
AIRCRAFT COMPANY

WM. W. WOODRUFF Director, Governmental Affairs

August 12, 1986

The Honorable Bill Nelson
U.S. House of Representatives
Committee on Science & Technology
Subcommittee on Space Science & Applications
Washington, DC 20515

Dear Mr. Chairman:

Your Subcommittee will have a hearing today on H.R. 4316, a bill to amend title 35, United States Code, and the National Aeronautics and Space Act of 1958, with respect to the use of inventions in outer space.

Hughes Aircraft Company supports the major thrust of this bill since it clarifies an area of previous uncertainty relating to the applicability of U.S. patent laws to inventions made or used in outer space. It is important, however, that any changes in the present laws do not operate to the disadvantage of current patent applications and litigants who should be able to have their rights determined on the basis of laws in effect at the time during which their rights accrued. H.R. 4316 provides specific protection in this regard for litigants in Section 2 at line 15:

(c) Amendments Not to Affect Certain Pending Cases. --The amendments made by section 1 shall not affect the right of any party in any case pending in a court on the date of the enactment of this Act to have the party's rights determined on the basis of the substantive law in effect before such date of enactment.

Hughes is the owner of the Williams patent (U.S. Patent No. 3,758,051) which covers an attitude control system for satellites. Hughes is actively enforcing this patent by way of infringement actions filed against the United States Government (Claims Court No. 426-73) and against Ford Aerospace, INTELSAT and COMSAT (U.S. District Court, D.C., Nos. 86-1475, 85-3658, and 85-3660).

We strongly urge you and the members of your subcommittee to retain Section 2 (c) in the bill in its present form.

I would appreciate you bringing our views to the attention of the Subcommittee during the mark-up of the bill.

Sincerely,


William W. Woodruff

1100 Wilson Boulevard
Arlington, Virginia 22209
(703) 525-1550

MRAMicrogravity Research Associates, Inc.
Materials Processing in Space

August 28, 1986

Gloria Boswell
Committee on Science and Technology
Room 2324 Rayburn House Office Building
Washington, D. C. 20515

Dear Ms. Boswell:

Enclosed is a copy of my testimony for the House of Representatives Hearing on August 12, 1986 for the Committee on Science and Technology. Sorry I was not able to be there.

If you use this, please let me know.

Sincerely,

Russell J. Ramsland, Jr.
Russell J. Ramsland, Jr.
Executive Vice President

RJR/sr

Encl.

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TESTIMONY

BY

RUSSELL J. RAMSLAND, JR.

EXECUTIVE VICE PRESIDENT

MICROGRAVITY RESEARCH ASSOCIATES, INC.

FOR

COMMITTEE ON SCIENCE AND TECHNOLOGY

U. S. HOUSE OF REPRESENTATIVES

AUGUST 12, 1986 HEARING

Microgravity Research Associates, Inc., (MRA), is a small business formed in 1979 for the purpose of producing the very highest quality bulk crystals (i.e. of epitaxial quality) of binary compounds, their ternaries and quaternaries. The initial investigation focused on GaAs with subsequent expansion into other crystalline materials.

Microgravity Research Associates (MRA) potential product line is of particular interest to leading edge, high technology companies which manufacture large advanced systems, scientific instruments and equipment. Because of their high quality and bulk wafer form, these crystals will enable firms to develop totally new ranges of devices (electrical, optical, and electro-optical) which will enhance their systems, computers, scientific instruments and other product lines to such a degree that they will clearly outperform the competition.

Currently MRA is routinely growing the crystals described above in limited quantities and limited sizes in their laboratories at MIT under an ongoing program of sponsored research and exclusive licensing.

MRA has embarked upon a program in conjunction with NASA to demonstrate that these same ultra-high quality crystals can be grown in space, but in space there is no theoretical limit as to the size to which these crystals can be grown. This program takes the form of a Joint Endeavor Agreement (JEA) wherein NASA has granted MRA access to seven free flight opportunities on the Shuttle in order to translate and refine the hardware involved with MRA's earth-based production system to one more suitable for space production.

With this brief introduction to MRA, it is quite easy to see why we are very interested in the issues being explored by these subcommittee hearings and are pleased to have the opportunity to contribute.

While we are not experts on international law or the fine intricacies of patent law, there are still issues contained in both bills (H.R. 3112 and H.R. 4316) that we believe need to be studied and addressed further. Specifically, in H.R. 3112 it appears that the intent is to foster the commercialization of outer space. While we believe these objectives are laudable, we would raise certain questions in regard to section 223 which refers to the government taking license to all inventions made in outer space under government contract in the case of full or nearly full funding of the costs and services of the contract by the government.

At first glance this appears to be the reasonable plan of a government that desires to promote space activity while at the same time remaining as a good steward of the taxpayer's dollars. However, upon closer inspection, we believe that this will prove to be very counterproductive. Consider the example of a high-technology company (Company X) which is a leading edge

maker of semi-conductor chips. To attain such an enviable position, Company X has invested hundreds of millions of dollars in research, facilities, marketing, etc. and must continue to do so in order to remain ahead of it's global competition. Suppose now that it would like to investigate outer space as a medium to produce an even greater quality microchip than it now can produce on Earth. To do this, Company X will draw on the knowledge gained through it's current chip facilities and build a \$3.5 million facility to test space. The DoD wants to help foster this technology and agrees to give Company X a contract wherein the DoD will afford Company X five free flights plus some cost reimbursement to work on the technology. At this point the DoD has "invested" \$85 million in dedicated flight costs and reimbursables pursuant to the contract and Company X has \$3.5 million, or to put it another way, the DoD has paid substantially all of the costs incurred under this contract. Under this bill, Company X would probably be in a very poor position regarding the patents that would come out of the contract work, and yet they have already invested many times the DoD contribution to this contract, in attaining the ability to perform the service in the first place.

There are arguments that under this provision a Federal Agency is not bound, in theory, to take the licensing rights but the regulations pursuant to this language have not been written. Further, in the real world of Federal Agencies this issue would be, at best, a serious impediment to initiating a project in the first place much less coming to a conclusion that would encourage others to follow. The government should further realize that in leaving the patent rights to the inventor, the potential exists for work done under Federal contract to be bid at a much lower cost than would otherwise be the case since the contractor is not simply working for a one-time cash payment, but is also working to enhance his own long-term competitive position through technology development that he can own and potentially exploit. This would not negate any of the current provisions or power of the national security laws, but would work alongside and in conjunction with them.

Finally, the government should realize that a royalty-free license of any sort for the government is a very serious impediment and that what the average bureaucrat may perceive as a "reasonable" proposition often has no validity in the minds and practices of those who must try to earn their living in the private sector. MRA takes the position that for the government to foster the greatest pursuit of knowledge in the shortest span of time, the government needs to relinquish it's arguments for any sort of patent rights or royalties from space-derived research and trust the free market system to maximize the benefits for all mankind from such research.

With reference to H.R. 4316, it also appears to be a well-intentioned bill but also raises several questions. As such, we support the intent, and to

that end we feel it might be more useful at this juncture to mention specific questions we have rather than to comment in a more general fashion on the bill.

To begin, this bill ties the ability to obtain the designation of "made or used within the United States" to a vehicle that is under the jurisdiction or control of the U.S. This seems to be arbitrary and artificial. Why not instead offer this designation to any U.S. company, regardless of what vehicle it is carried on? Or perhaps why not let a company elect, before it goes into space, whose laws it wants to be governed by? For the foreseeable future, there may not be vehicles capable of delivering certain required performance standards that are under the control or jurisdiction of the U.S. Why should this therefore be a basis for denying U.S. designation status to products or services made by U.S. companies on foreign vehicles? Does it really make sense to assert that for two identical products made by the same U.S. company on two independent vehicles in the same orbits, one French controlled and one U.S. controlled, we should designate one as an import and one as a domestic product? Further, should one product come under one set of patent laws and the other play by a different set of rules?

Basically we at MRA are guessing that the formulation for having the law follow the vehicle's controlling nation's law came from an analogy, perhaps that of maritime law. The problem is that the maritime laws were developed for ships that were going out to discover new worlds or were engaged in hauling cargos from one country to another. In much of space's activities, the function is to develop new knowledge or manufacture new products while on board. While this perspective sounds innocuous at first, the very fact that the basic function being carried out is vastly different than that which prevails under maritime law means that the analogy and hence the law that springs from it may be dangerously flawed.

This same argument also points out why we cannot simply develop patent law as we go along, as has been suggested by some, since the importance of patents and trade secrets will be much more important in the decision to even get involved in space research in the first place. The pedantic "ex facto sacro lex" (roughly speaking "those laws are best that respond to the facts") approach to developing law as actual problems crop up must be tempered with the realization that in the absence of some original ground rules, there may be very little or no private work done in space. However, the very fact that this bill exists and that hearings are being conducted indicates to us that some in Congress are already sensitive to the need to begin a framework.

The final question centers around the language in the proposed bill involving exceptions to the designation of under U.S. control or jurisdiction. Quite simply, what is the status of the exceptions? Does this bill assume that international agreements will provide for the answers related to the issues

addressed in this bill? If not, then what is the status? As a further secondary issue to all of this is the problem of modules versus vehicles. Where and how does one draw the line in order to understand where the sovereignty lies between the two? This point in particular highlights the problem of tying inventions to vehicles or modules as far as patent law and import laws are concerned. What happens to the product from a U.S. company's factory that is on a U.S. free flyer when the free flyer is sold to the Japanese? Has the product suddenly become an import to the U.S.?

In summary, we at MRA feel this bill has the outline of a worthwhile piece of legislation. However, we question the delineation of rights according to the vehicle's sovereignty, and if this is to become the standard, we urge that some further thought be given to some of the new issues and ramifications that arise from the functions that space will provide (i.e. basic research) as opposed to the functions provided by various alternative analogies.

APPENDIX #3

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4 September 1986

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The Honorable
Bill Nelson
Chairman
Space Science and Applications Subcommittee
2324 Rayburn HOB
Washington, D.C. 20515

Re: Amendment of
H.R. 4316

Dear Mr. Chairman:

In testimony before the Subcommittee on Space Science and Applications on August 12, 1986, I urged that H.R. 4316 be amended by deleting the phrase "under the jurisdiction or control of the United States" and by substituting language that would apply U.S. patent law to inventions made or used on vehicles on the registry of the United States. In my testimony and statement before your subcommittee I explained that the current language of H.R. 4316 is vague and could lead to potential litigation and conflicts of laws between nations.

Subsequent to the hearing on August 12, it has come to my attention that there is a precedent for our suggested amendment. In 1981 the criminal code of the United States was amended by Public Law 97-96 (95 Stat. 1210) to extend U.S. criminal law jurisdiction to cover activities in outer space. As you know, the jurisdiction of U.S. patent law, like the jurisdiction of the U.S. criminal code, is territorial. Therefore, we believe it is important to note that the application of the U.S. criminal code to activities in outer space is determined by the registry of the vehicle. The U.S. criminal code uses language almost identical to the language we have suggested be used in H.R. 4316. Title 18 section of the United States Code provides:

"The term "special maritime and territorial jurisdiction of the United States," as used in this title includes:

* * * *

(6) Any vehicle used or designed for flight or navigation in space and on the registry of the United States pursuant to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies and the Convention on Registration of Objects Launched into Outer Space, while that vehicle is in flight, which is from the moment when all external doors are closed on Earth following embarkation until

WASHINGTON D.C.

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the moment when one door is opened on Earth for disembarkation or in the case of a forced landing, until the competent authorities take over the responsibility for the vehicle and for persons and property aboard." (Emphasis added).

The rationale for the 1981 amendment to the Criminal Code was very similar to the rationale for the introduction of H.R. 4316. The Committee on Science and Technology explained the amendment to the criminal codes in P.L. 97-96 as follows:

"Section 6 would amend Section 7 of title 18, United States Code, to extend the special maritime and territorial jurisdiction of the United States to include any vehicle used or designed for flight or navigation in space and on the registry of the United States pursuant to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty) and the Convention on Registration of Objects Launched into Outer Space. Such jurisdiction would attach while the vehicle is in flight, which is defined to be from the moment when all external doors are closed on earth following embarkation until the moment when one such door is opened on earth for disembarkation, or in the case of a forced landing, until the competent authorities take over the responsibility for the vehicle and for the persons and property aboard. As used in this section, "vehicle" is intended to comprehend the meaning of "space vehicle" as defined, for example in subsections 103(2) and 308(1) of the National Aeronautics and Space Act of 1958, as amended.

Under the Outer Space Treaty a signatory State retains jurisdiction and control over objects on its registry that are launched into outer space. Objects in outer space are therefore subject to the laws of the State of registry to the extent that such laws have extraterritorial effect in outer space. Under current United States law, there is no clear United States jurisdiction over criminal acts committed on a space vehicle, such as the Space Shuttle, while in flight. This amendment to title 18 would establish such jurisdiction over U.S. registered vehicles while in outer space as well as during the launch and reentry/landing phases. By defining "flight" to begin when the external doors of the vehicle are closed on the earth following embarkation and to end when one external door is opened on earth for disembarkation, a clear inter-

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face is established between federal and state criminal jurisdiction. It should also be pointed out that under the Convention on Registration of Objects Launched into Outer Space, when there are two or more launching States in respect to any space object, the launching States may jointly determine which one of them shall register the object and may also conclude agreements regarding the jurisdiction and control over the space object and over any personnel thereof. This amendment to title 18 is not intended to prejudice any such agreements on jurisdiction entered into pursuant to the Convention."

Because proposed Patent Act amendment (H.R. 4316) and the Criminal Code Amendment (P.L. 97-96) both deal with the territorial jurisdiction of U.S. law, we believe that the two provisions should have the same standards. As the laws of the United States are amended to cover new activities in outer space, it is important to maintain the consistency and clarity established by P.L. 97-96.

No witness before your committee offered any substantial reason to oppose our suggested amendment. This absence of substantive opposition is consistent with the previous legislative treatment of U.S. territorial jurisdiction discussed above in the context of the Criminal Code. Mr. Robert F. Kempf, NASA Assistant General Counsel testified that legislative history indicating that patent law jurisdiction is to be determined prima facie by the registration of the vehicle would be preferable to the amendment we have proposed. However, Mr. Kempf did not give any reasons for his opposition to our amendment. The wording of P.L. 97-96 is similar to the wording we have suggested for amendment to H.R. 4316 and was endorsed by NASA in 1981. (See Testimony of NASA General Counsel, Neil Hosenball, 1982 NASA Authorization Hearings before the Subcommittee on Space Science and Applications, 9th Congress, First Session, Volume V, at 2600-12 (March 1981)). While P.L. 97-96 dealt with the Criminal Code and H.R. 4316 deals with the patent law, the essential issue in both cases is the issue of territorial jurisdiction. Because the legislative history of both measures indicates that there is no substantive difference in the intent of the measures, identical wording of the two provisions is required to avoid disparate interpretations.

Mr. Michael K. Kirk, Assistant Commissioner for External Affairs for the Patent and Trademark Office, also raised the question of the possible effect of our proposed amendment on "non-space" applications of the U.S. patent law. We point out that Mr. Kirk's concern appears to apply equally to the current wording of H.R. 4316. This issue can easily be resolved

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by utilizing language identical to that used in 18 U.S.C. § 7(6). Thus U.S. patent law would apply to inventions made or used on vehicles on the registry of the United States while "in flight." Section §7(6) of Title 18 defines a vehicle in flight as "from the moment when all external doors are closed on Earth following embarkation until the moment when one door is opened on Earth for disembarkation" The patent law of the territory in which the vehicle is located before and after launch would apply to pre- and post-launch activities. This treatment is consistent with existing law and would effect no change. Therefore, we believe that an amendment consistent with 18 U.S.C. §7(6) would meet concerns raised by Mr. Kirk.

We respectfully request the Subcommittee to consider amendment of H.R. 4316 to make it consistent with 18 U.S.C. § 7(6). Attached for your reference is a copy of H.R. 4316 as we urge it be amended.

Thank you for your consideration and the opportunity to present our views to your Subcommittee.

Very truly yours,

BENNER, BURNETT & COLEMAN



Dennis James Burnett
Counsel to Messerschmitt-
Bolkow-Blohm GmbH

Enclosure

cc: Lillian Trippett

Section 1. Space Inventions.

(a) Amendments to Title 35, United States Code.

(1) Chapter 10 of title 35, United States Code, is amended by adding at the end the following:

"§ 105. Inventions in outer space

"Any invention made or used in outer space on an aeronautical and space vehicle (as defined in section 103(2) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2452(2)) ~~[under the jurisdiction or control of the United States]~~ which is on the registry of the United States pursuant to the Treaty of Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies and the Convention on Registration of Objects Launched into Outer Space, while that vehicle is in flight, which is from the moment when all external doors are closed on Earth following embarkation until the moment when one door is opened on Earth for disembarkation or in the case of a forced landing, until the competent authorities take over the responsibility for the vehicle and for persons and property aboard, shall be considered to be made or used within the United States for purposes of this Act, except with respect to any space vehicle or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party."

(2) The table of sections of chapter 10 of title 35, United States Code, is amended by adding at the end the following:

"105. Inventions in outer space."

(b) AMENDMENT TO THE NATIONAL AERONAUTICS AND SPACE ACT.

Section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457) is amended by adding at the end the following new subsection:

"(m) Any invention made or used in outer space on an aeronautical and space vehicle (as defined in section 103(2)) ~~[under the jurisdiction or control of the United States]~~ which is on the registry of the United States pursuant to the Treaty of Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies and the Convention on Registration of Objects Launched into Outer Space, while that vehicle is in flight, which is from the moment when all external doors are closed on Earth following embarkation until the moment when one door is opened on Earth for disembarkation or in the case of a forced landing, until the competent authorities take over the responsibility for the vehicle and for persons and property aboard, shall

be considered to be made or used within the United States for purposes of this Act, except with respect to any space vehicle or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party."

APPENDIX #4



European space agency
agence spatiale européenne

HON. BILL NELSON
CHAIRMAN
SUBCOM. ON SPACE SCI. & APPLICATIONS
COMMITTEE ON SCI. & TECHNOLOGY
2324 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515

REF. #:201/1602
SEPTEMBER 15, 1986

DEAR SIR:

ON TUESDAY AUGUST 12TH THE SPACE SCIENCE AND APPLICATION SUB-COMMITTEE HELD HEARINGS ON HR 4316 AND HR 3112. IN THE COURSE OF QUESTIONING OF MR. KEMPF, BY MR. LUJAN, ON THE SUBJECT OF REGISTRATION OF SPACE OBJECTS, MR. LUJAN ASKED, "WAS SPACELAB LISTED IN THE REGISTRY AS A U.S. VEHICLE".

THIS QUESTION WAS NOT ANSWERED IN THE SUBSEQUENT DISCUSSION. THE AGENCY WOULD THEREFORE, LIKE TO TAKE THE OPPORTUNITY TO PROVIDE AN ANSWER IN THE FOLLOWING MANNER:

"THE SPACELAB PROGRAMME WAS UNDERTAKEN BY THE EUROPEAN SPACE RESEARCH ORGANISATION, WHICH PRECEDED THE EUROPEAN SPACE AGENCY, AS A "TECHINCALLY INTEGRATED PART OF THE UNITED STATE'S SHUTTLE AND ORBITAL SYSTEM AND EUROPE'S CONTRIBUTION TO THE POST-APOLLO PROGRAMME WITH WHICH IT IS TO BE USED" (ARTICLE 1 OF SPACELAB ARRANGEMENT SIGNED BETWEEN CERTAIN MEMBER STATES OF ESRO, ENTERED INTO FORCE ON 10 AUGUST 1973). THIS SITUATION IS BEST REFLECTED IN THE AGREEMENT SIGNED ON 14 AUGUST 1973 BETWEEN THE GOVERNMENT OF THE U.S. AND CERTAIN EUROPEAN GOVERNMENTS, ARTICLE 7-D STATING THAT "IN ORDER TO ASSURE THE INTEGRITY OF OPERATION AND MANAGEMENT BY THE GOVERNMENT OF THE U.S.-A. OF THE SPACE SHUTTLE SYSTEM, THIS GOVERNMENT SHALL HAVE FULL CONTROL OVER THE FIRST SPACELAB UNIT..."

"THE INTERGOVERNMENTAL AGREEMENT AND THE MOU CONCLUDED BETWEEN NASA AND ESRO WERE SILENT ON THE POINTS OF OWNERSHIP AND REGISTRATION; AT THE TIME OF THEIR SIGNATURE THE U.N. REGISTRATION CONVENTION WAS JUST IN ITS DRAFTING PROCESS. THE IGA GRANTED THE U.S. GOVERNMENT FULL CONTROL OVER THE USE OF SPACELAB, INCLUDING THE RIGHT TO MODIFY IT. WHEN ESA, HAVING DECLARED ITS ACCEPTANCE OF THE PROVISIONS OF THE U.N. REGISTRATION CONVENTION, TRIED TO

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OPEN DISCUSSIONS WITH NASA ON ISSUES SUCH AS REGISTRATION, STATUS OF PERSONNEL ON BOARD, AND PATENTS, PROPOSING AN ADDITIONAL MOU, THE ATTITUDE TAKEN BY NASA WAS TO CONSIDER SPACELAB AS ANY OTHER COMPONENT OF THE SHUTTLE, AND NOT AS SPACE OBJECT IN ITSELF. NOT BEING A SPACE OBJECT, THE QUESTION OF ITS REGISTRATION BECAME IRRELEVANT. IN NASA'S VIEW, TO QUALIFY AS A SPACE OBJECT, THE OBJECT HAS TO BE DETACHED FROM THE SHUTTLE AND BE SELF-SUPPORTING. THIS APPROACH - NOT ACCEPTED BY ESA - APPEARS IN THE STANDARD LAUNCH AGREEMENTS PROPOSED BY NASA."

I HOPE THE ABOVE CLARIFIES THE SITUATION REGARDING SPACELAB REGISTRATION ADEQUATELY AND THE SAID CLARIFICATION COULD BE INCLUDED IN THE RELEVANT HEARING RECORD.

YOURS SINCERELY,



IAN W. PRYKE
HEAD, WASHINGTON OFFICE